SHOUT
SHARE
IT

LIBRARIES SMITHSONIAN INSTITUTION

SMITHSONIAN INSTITUTION LIBRARIES

MAGAZINE OF BOTANY.

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

C

"Flowers of all hue."

VOLUME THE EIGHTH.

51.562

LONDON:
PUBLISHED BY Wm. S. ORR & CO., PATERNOSTER ROW.

MDCCCXLI.

13.

LONDON:
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

QK
1
P342
V.8, c.1
SCNHRB

TO THE

COUNTESS OF CARLISLE,

AS A TRIBUTE TO

HER LADYSHIP'S INTIMATE CONNEXION WITH SEVERAL OF THE MOST ILLUSTRIOUS PATRONS OF BOTANY;

BUT MUCH MORE FOR

A HUMBLE MEMENTO OF THE PERSONAL ATTACHMENT TO FLOWERS

WHICH

HER LADYSHIP HAS CONSTANTLY EVINCED;

This Eighth Volume

OF

THE MAGAZINE OF BOTANY

IS KINDLY ALLOWED TO BE DEDICATED,

BY

HER LADYSHIP'S GRATEFUL AND MOST OBEDIENT SERVANT,

JOSEPH PAXTON.

ADVERTISEMENT.

At the outset of the Volume of which this Number forms at once the conclusion and preface, it was announced that more popular subjects would be treated of in the letter-press, and that fewer drawings of rare plants, which only a small portion of our readers can cultivate, would be introduced.

To the principal part of the former, and to the numerous figures, we may refer as proofs of the manner in which that promise has been performed. Principles of practical importance, points of general culture, details in the management of interesting plants, and descriptive notices of ornamental ones, have been largely furnished, with a view to the assistance and gratification of amateurs as well as professional gardeners. Indeed, our object has been to touch upon no matters which will not be almost equally acceptable to all; and, in this respect, we imagine some slight improvement has been effected.

It is in the coloured embellishments of the work, however,—the great diversity in the form, habit, and hue of their subjects, and the correctness and elegance of their preparation,—that we rest our claim to distinction among contemporary periodicals. The newest plants are never figured because they are novel; nor are the oldest neglected on account of their having been long known. Beauty of character has been our sole guide in their selection; and from the extraordinary opportunities with which we are favoured, scarcely anything is left to be desired on this head.

With regard to the execution of the plates, an artist of first-rate ability in this department is attached exclusively to the Magazine, and travels personally to the different nurseries and gardens in order to prepare the representations, afterwards inspecting and superintending the work of both engraver and colourer.

Although thus possessing advantages which no similar publication enjoys, we propose a considerable extension of them in the next Volume, by having the figures lithographed on zinc. This, we have found, will impart such a softness and delicacy to the outline and shades of each picture, that, when coloured, they will hardly be distinguishable from the original drawing. But what will give the highest value to the arrangement is, that the whole of the lithography will be done by the artist who portrays all the plants from nature.

Circumstances which we have regretted, but could not alter, have hitherto prevented us from inserting the sketches of flower-gardens and other objects which we contemplated supplying. We confidently hope shortly to be able to remove all obstacles, and so to add another pleasing and useful feature to the work.

A number of simple practical papers, embracing every particular necessary for the guidance of the uninitiated, and some novel plans for the aid of the more experienced, will have a prominent place in future numbers. At the same time, those philosophical, tasteful, and scientific gardening topics, on which information is so much solicited and needed, will not be overlooked; but each reasonable inquiry or wish duly anticipated and satisfied.

To our friends and subscribers, who annually place us under increasing obligations, we profess a similar feeling of gratitude, and beg of every one who approves of the mode in which the Magazine of Botany is conducted, and of the endeavours which are incessantly made to adapt it more and more perfectly to the public wants, to lend it not only the sanction of their support, but their recommendation.

CHATSWORTH,
December 30, 1841.

LATIN INDEX

TO

THE COLOURED FIGURES OF PLANTS.

Aérides quinquevúlnerum, 241
Allamánda cathártica, 77

Batàtas bonariénsis, 25
Beaufórtia decussàta, 269
Bignònia capreolàta, 245
Borònia ledifòlia, 123
Burlingtònia rígida, 193

Callistáchys longifòlia, 31
Caméllia Japónica ; var. Albértii, 53
Chorozèma Dicksònii, 173
Còleus barbàtus, 219
Cùphea Melvílla, 197

Dáphne japónica, 175
Dendròbium macrophýllum, 97

Epiphýllum truncàtum ; var. violàceum, 79
Erìca Jacksònii, 149

Fùchsia corymbiflòra, 7

Galeándra Devoniàna, 145
Gentiàna septémfida, 51
Gesnèra móllis, 243
Gesnèra zebrìna, 271
Goldfússia glomeràta, 121

Hardenbérgia Comptoniàna, 27
— macrophýlla, 267

Helichrýsum níveum, 99
Hibíscus Camerònii, 3
Húntleya violàcea, 1

Ipomœ̀a tyrianthìna, 73

Kaulfússia amelloìdes, 195

Lechenaùltia bilòba, 151
Lílium speciòsum ; var. álbum, 127
Lophospérmum erubéscens ; var. spectábile, 75

Mariánthus cæruleo-punctàtus, 247
Mirbèlia floribúnda, 103

Odontoglóssum gránde, 49
Oncídium Ínsleayii, 265

Pascàlia glaùca, 125
Portuláca Thellusònii, 29

Rhododéndron Gibsònii, 217
Ròsa Devoniénsis, 160

Schizánthus Evansiànus, 171
Solànum jasminoìdes, 5
Stáchys coccìnea, 101

Tropæolum Moritziànum, 199

Witsènia maùra, 221

Zìchya pannòsa, 147

ENGLISH INDEX

TO

THE COLOURED FIGURES OF PLANTS.

Air-plant, five-spotted flowered, 241
Allamanda, cathartic, 77

Batatas, Buenos Ayres, 25
Beaufortia, decussate-leaved, 269
Boronia, Ledum-leaved, 123
Burlingtonia, rigid-stemmed, 193

Callistachys, long-leaved, 31
Camellia, Prince Albert's, 53
Chorozema, Mr. Dickson's, 173
Coleus, bearded-flowered, 219
Cuphea, Mr. Melville's, 197

Daphne, Japan, 175
Dendrobium, broad-leaved, 97

Epiphyllum, violet-flowered truncated, 79

Fuchsia, corymb-flowered, 7

Galeandra, Duke of Devonshire's, 145
Gentian, seven-cleft flowered, 51
Gesnera, soft-leaved, 243
  — zebra-like leaved, 271
Goldfussia, aggregated-flowered, 121

Hardenbergia, broad-leaved, 267
  — Lady Northampton's, 27
Heath, Mr. Jackson's, 149
Helichrysum, snowy-flowered, 99
Hibiscus, Mr. Cameron's, 3
Huntleya, violet-flowered, 1

Indian Cress, Mr. Moritz's 199
Ipomœa, deep-purple flowered, 73

Kaulfussia, Amellus-like, 195

Lechenaultia, two-lobed flowered, 151
Lily, white showy, 127
Lophospermum, spotted rosy-flowered, 75

Marianthus, spotted blue-flowered, 247
Mirbelia, many-flowered, 103

Nightshade, Jasmine-like, 5

Oncidium, Mr. Insleay's, 265

Pascalia, glaucous-leaved, 125
Purslane, Mr. Thelluson's, 29

Rose, Devonshire, 160
Rose Bay, Mr. Gibson's, 217

Schizanthus, Mr. Evans's, 171

Stachys, red-flowered, 101

Tooth-tongue, magnificent, 49
Trumpet-flower, tendrilled, 245

Witsenia, dark-flowered, 221

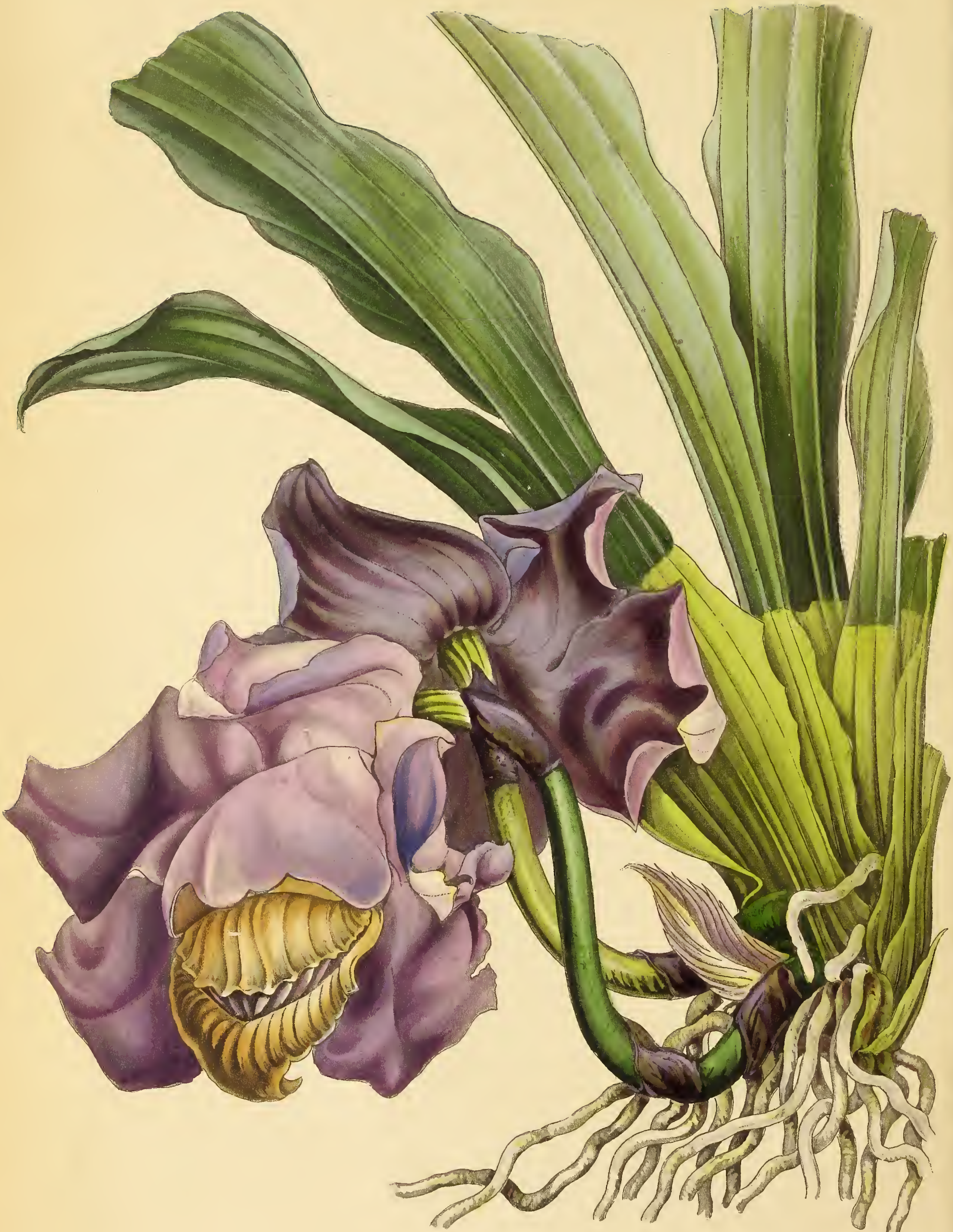
Zichya, fiddle-shaped leaved, 147

WOODCUT ILLUSTRATIONS.

VOLUME THE EIGHTH.

Aerides quinquevulnerum, 242
Beaufortia decussata, 270
Burlingtonia rigida *, 194
Coleus barbatus, 220
Dendrobium macrophyllum, 98
Fuchsia corymbiflora, 8
Galeandra Devoniana, 146
Gesnera mollis, 244
Gesnera zebrina, 272
Huntleya violacea, 2
Marianthus cæruleo-punctatus, 248
Odontoglossum grande, 50
Oncidium Insleayii, 266
Witsenia maura, 222

* In most of the copies issued, this engraving has been inverted by mistake.



Huntleya violacea.

HÚNTLEYA VIOLÀCEA.

(VIOLET-FLOWERED HUNTLEYA.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

Generic Character.—*Perianth* showy, nearly equal; lateral sepals folded a little obliquely at the front part of the base. *Labellum* flat, clawed, rhomboid, spreading, much fimbriated at the lower part, with the free base prolonged and articulated to the column. *Column* club-shaped, cucullate at the summit, with a winged margin. *Anthers* two-celled, pointless. *Pollen-masses* four.

Specific Character.—*Plant* epiphytal, stemless, and destitute of pseudo-bulbs. *Leaves* embracing each other at the base, erect, acute, slightly plaited. *Peduncles* axillary, from four to six inches long, pendulous, and bearing a single flower. *Sepals* and *petals* oblong, obtuse, curled at the margin, and rather so at the points. *Labellum* kidney-shaped, emarginate, with a conspicuously furrowed crest. *Column* large, fleshy, boat-shaped.

From the exceedingly singular character of the flowers, their peculiar and uncommon colour, and the liberality in which they are borne, this handsome Orchidaceous plant is entitled to very high consideration among the admirers of the tribe. Besides, it has now become almost the sole representative of a remarkable genus; for Messrs. Rollisson of Tooting, who possessed the only plant of *H. meleagris*, having separated it with the view of supplying a gentleman, who was extremely desirous of obtaining it, with a specimen, lost the original; and, with the exception of that above mentioned, which has since furnished a small sickly offset to the firm from whence it was procured, we believe there is no more at present living in the country.

H. meleagris is not very different from the species now before us in habit or appearance; and the flowers, too, are uniformly solitary: they are produced, however, on erect peduncles, and have a yellow-coloured ground, with irregular blotches of brownish purple. The blossoms of *H. violacea* are, on the contrary, protruded on pendulous scapes; their form is more interesting, their size greater, and their hue a beautiful bluish purple or violet. They appear indifferently at nearly all seasons, and we have seen them expanded at Messrs. Loddiges' at least six or seven times in the year: in addition to which, the flowers last several weeks. A large specimen will sometimes develop from four to six flowers at once; and their dimensions, striking tints, and the curious crest on their lip, render them most deeply interesting.

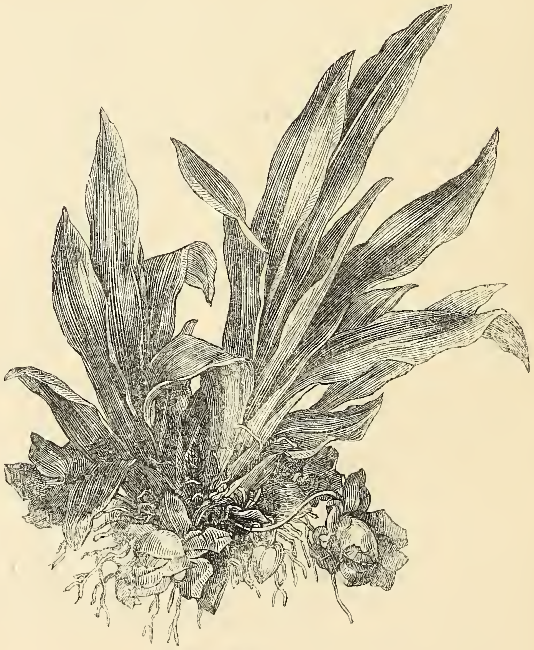
Both the species of this genus were imported from South America; and *H. violacea* was received by Messrs. Loddiges two or three years back. It was discovered by Mr. Schomburgk, for the first time, on the banks of the river Essequibo, in British Guiana, and subsequently in several other places, but always in the vicinity of cataracts. It grows on the branches of large trees, which spread their shade over it, and, from the character of the locality, is always surrounded by the vapour which the spray of the waterfalls occasions.

These last circumstances are of great importance in its cultivation. A warm, humid, and partly obscured atmosphere is of the last moment; and Messrs. Loddiges, whose Orchidaceous house is notorious for these features, are singularly successful in its treatment. It does not appear to require that repose which other Orchidaceous plants so much need; since, being without either stems, or pseudobulbs, or very thick leaves, it will bear a more constant stimulation. That such conditions are, at any rate, by no means prejudicial, is perfectly obvious from the specimens in the collection of these gentlemen, which not only grow vigorously, but flower most profusely. It seems to thrive best in a well-drained pot filled with heath-soil and potsherds, and to demand repotting annually.

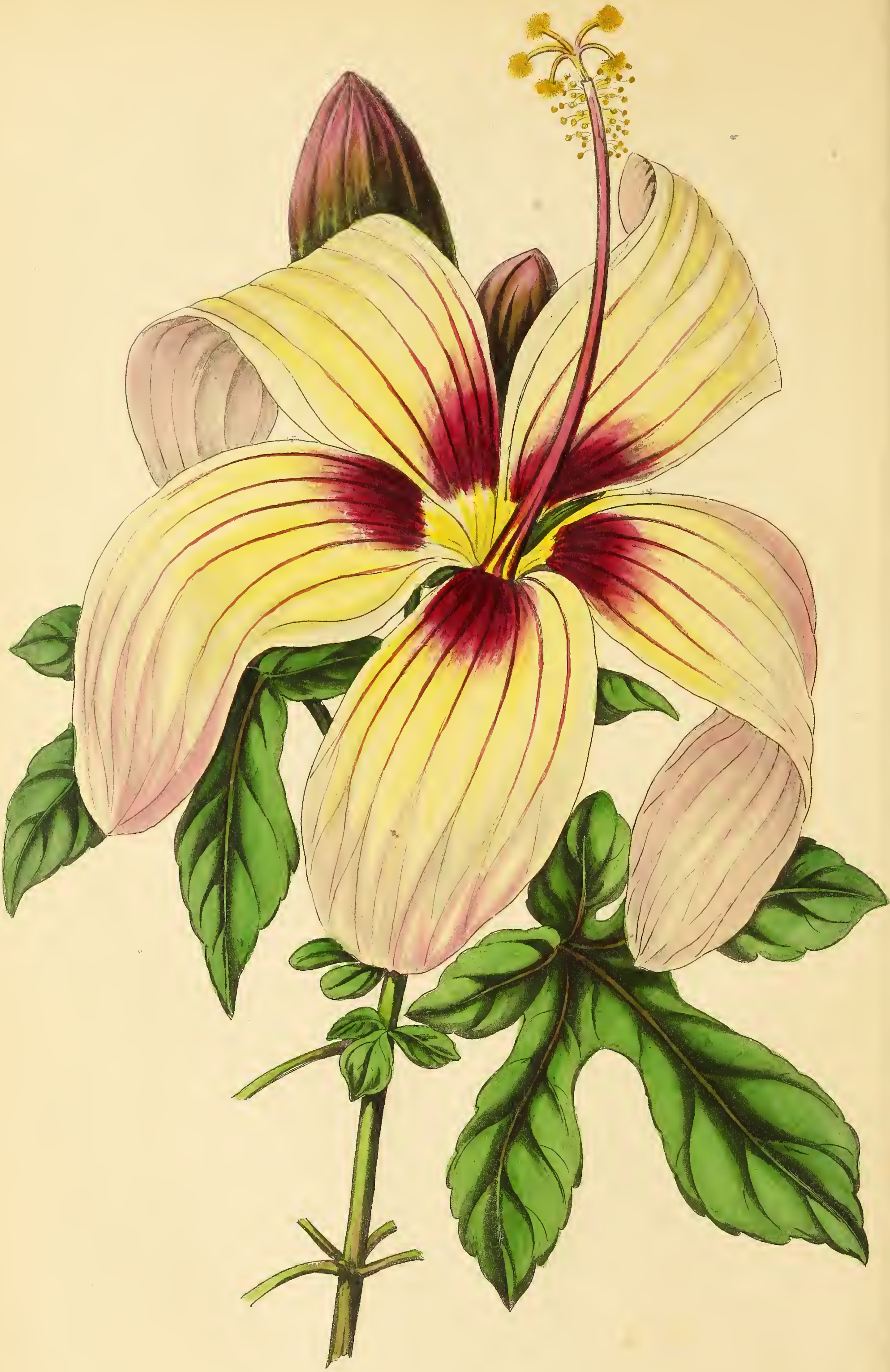
In making any offsets to propagate it, care must be taken not to divide it while it is growing, nor to cut through it too roughly, nor to subject it to too much moisture after being severed.

Our drawing was taken from Messrs. Loddiges' in April 1840. The engraving exhibits the entire plant.

The genus was named in honour of the Rev. Mr. Huntley, a zealous cultivator of Orchidaceæ, and among the first who devoted particular attention to them. It is allied to *Zygopetalum*. The specific name refers to the tinge of violet in the flowers.



DSI



Hibiscus Cameronii.

HIBÍSCUS CAMERÒNII.

(MR. CAMERON'S HIBISCUS.)

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

NATURAL ORDER.
MALVÀCEÆ.

Generic Character.—*Calyx* compressed by a many-leaved, rarely by a few-leaved involucel; sometimes connected at the base. *Petals* not auricled. *Stigmas* five. *Carpels* joined into a five-celled, five-valved capsule, with a dissepiment in the middle of each valve on the inside. *Cells* many-seeded, rarely one-seeded.—*Don's Gard. and Botany.*

Specific Character.—*Plant* shrubby. *Stem* three feet high, downy. *Leaves* petiolate; lower ones heart-shaped, and notched; upper ones with five unequal lobes, of which those nearest the extremity are lanceolate, acute, and notched; and those at the base, roundish, smaller than the others, and bluntly notched. *Stipules* wanting. *Flowers* solitary. *Corolla* expanded, somewhat revolute. *Petals* ovate, obtuse, having a wavy margin of a dull buff-colour, tinged with rose, and conspicuously veined; with claws of a bright buff, surrounded with a rich and beautifully rayed deep morone-colour. *Calyx* five-parted, persistent; segments acuminate. *Involucellum* usually ten-leaved, minute. *Filaments* united. *Style* one. *Stigmas* five, ciliated. *Ovary* covered with strong stiff yellow hairs; cells with about two seeds in each. *Seeds* black, flattened on one side, with a prominent protuberance, containing the embryo, on the other.

We owe the drawing from which the accompanying figure has been prepared to the kindness of Mr. Cameron, the enlightened curator of the Birmingham Botanic Garden, whose daughter executed it for us in a very superior manner from a plant which flowered in that establishment in the summer of 1840. The species will be seen to be a particularly showy one; and we are happy to find that it has been selected by Messrs. Knowles and Westcott, the editors of the late Floral Cabinet, to commemorate the intelligent individual above named.

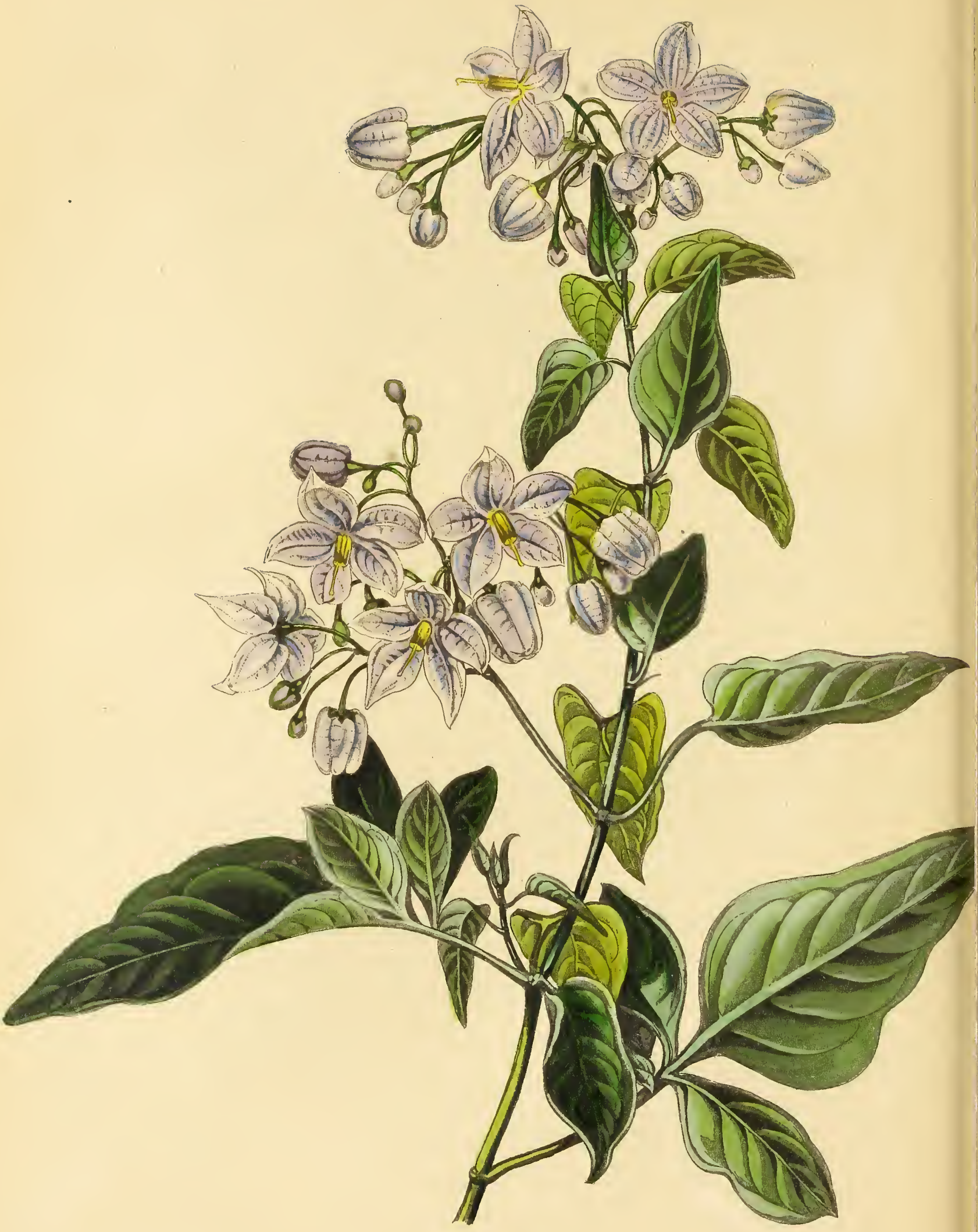
Having been favoured by Mr. Cameron with a letter respecting the history and management of this plant, we prefer giving these in his own words. He remarks that "the seeds from which our plant was raised, were collected in some part of Madagascar, by the missionaries, and forwarded to the Rev. J. A. James, of Birmingham, who presented them to this establishment in 1837. During the past summer several of our plants attained the height of three feet, with a few side branches, which produced a flower from the axil of each leaf. Each individual flower remains open from eight or nine in the morning till four or five in the afternoon. Five or six of these flowers were often opened in a day from one plant, which continued to produce a succession of them for two or three months; and, by having plants of different ages, we were seldom without some expanded flowers throughout the summer and autumn of last season. The flowers were, also, fully double the size of those first developed.

"This plant appears to me to be one of the most desirable species of this large genus for cultivation; being a profuse bloomer, of a dwarf habit, and not by any means tender,—a cool stove being quite sufficient for it.

"The best soil for potting appears to be a mixture of loam, heath soil, and sand, with progressive shifting into larger pots as the plants advance in growth. Cuttings of the short side-shoots root readily in sand, in a gentle heat, in about a month. Seeds have also been perfected this season; from which, perhaps, plants of a more robust growth may be obtained, which would be an improvement. The seeds from which the first plants were raised, had evidently lost some of their vegetative power; since these plants never grew so vigorously as those did which were raised from cuttings taken from them. I may also remark that there is frequently some difference in the colour of the flowers, proceeding from the season at which they are produced, and the state of the weather at the time."

From these observations, the reader will be able to glean every fact of interest at present known concerning the species. We should rejoice to see our collections augmented by many other beautiful plants obtained in a similar way; and trust that missionary bodies will direct the attention of their agents to an object which is in itself so praiseworthy, and might so easily be accomplished. Probably seedling plants of this species will ultimately be found capable of flourishing in a greenhouse; and although their blossoms be fugitive, the abundance of them compensates for that defect.

Hibiscus is derived from *hibiscos*, one of the names applied by the Greeks to the Mallow; or from *Ibis*, a stork, which is supposed to eat one of the species.



Solanum jasminoides.

SOLÀNUM JASMINOÌDES.

(JASMINE-LIKE NIGHTSHADE.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
SOLANACEÆ.

Generic Character.—*Calyx* permanent; five, rarely four-cleft. *Corolla* rotate, rarely campanulate; five, rarely four-cleft. *Anthers* oblong, connivent, dehiscing by two pores at the apex. *Berry* almost globose, two, three, or four-celled, but usually two-celled. *Don's Gard. and Botany.*

Specific Character.—*Plant* a climbing shrub, evergreen. *Stems* slender, having a greenish appearance. *Leaves* alternate, with long petioles, ovate-lanceolate, slightly heart shaped at the base, obtuse, smooth, deep green above, rather paler beneath. *Calyx* five-cleft. *Flowers* disposed in a panicle. *Corolla* between campanulate and cup-shaped, small, pale blue.

Climbing shrubs comprise, for the most part, some of the most elegant forms of vegetation, and present claims to regard of which few are unconscious. As they are far from being cultivated in England to the extent they merit, we are gratified to find that the Council of the Horticultural Society announces its intention of awarding prizes for their exhibition as a distinct class.

Among the species of *Solanum*, there are scarcely any now grown which make the slightest approach to a climbing habit, and a still less number that exhibit the gracefulness of the one here brought forward. Being likewise an evergreen, it is rendered doubly valuable.

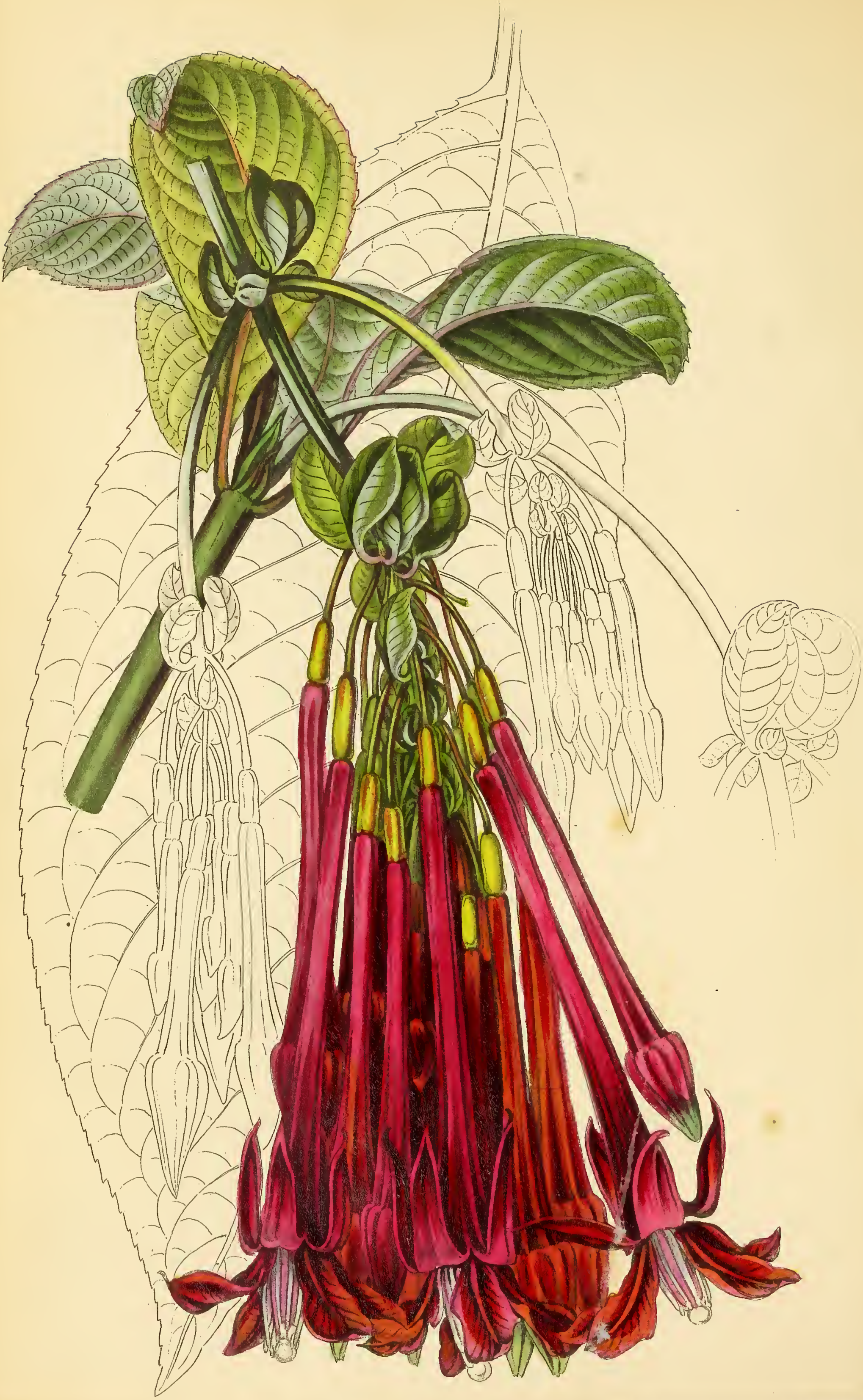
We have been unable to procure any certain information relative to its native country or introduction to Britain. All the intelligence of this kind which we have obtained is that the species was sent to Messrs. Young, of Epsom, from the Glasgow Botanic Garden, about two or three years since, and that it is considered a South American plant. The first time we saw its interesting flowers was at the Epsom Nursery, in the month of November 1839. It was there kept in a Camellia-house, planted in a pot, and trained round a small circular wooden trellis. The blossoms were borne liberally in copious clusters, each having from eight to twelve opened at the same time, and exhaling a delightful fragrance.

After that period, it continued blooming during the month of December, and created a very pretty feature in the greenhouse through the winter season. In the summer of 1840, it again commenced flowering, and in yet greater profusion; the plant being kept in its old position. A specimen at Mrs. Lawrence's, Ealing Park, also blossomed in that year; but we believe it was cultivated in a stove. The plant at Messrs. Young's was taken from the greenhouse towards the autumn, and having been planted in an open bed appropriated to climbing roses and similar objects, it was released from the trellis, and fastened to an erect pole. It there flowered most freely for several months, and we observed it in undiminished beauty at the end of November. On examining it a fortnight ago, we found it had been totally destroyed by the frost; although it is possible that new stems will be thrown up in the ensuing spring.

From these statements, it is palpable that the species will succeed best as a greenhouse climber; and to this class it is a peculiarly neat addition. The greenness of the young shoots, and the size, form, and surface of the leaves, give it the aspect of some species of *Jasminum*, on which account the specific appellation has been bestowed. It thrives well in a loamy soil, with a trifling admixture of heath-mould and sand, and does not need a very large pot. It can be trained spirally round any small wooden trellis, and will produce a long succession of its delicate flowers through the autumnal quarter of the year, and even in some of the early winter months. It does not require much water through the winter.

Cuttings, taken from the newly-formed shoots, and planted in sand or sandy loam, will root with facility, if placed in a moderate temperature, and covered with a hand-glass. And though extensive propagation should not be required, it will be advisable to prune the plants a little, lest they become too straggling.

The generic name was given by Pliny; but on what it is founded, it is impossible now to do more than conjecture. Many derivations have been offered, but none appear probable.



FUCHSIA CORYMBIFLORA.

(CORYMB-FLOWERED FUCHSIA.)

CLASS.	ORDER.
OCTANDRIA.	MONOGYNIA.

NATURAL ORDER.

ONAGRACEÆ.

GENERIC CHARACTER.—*Tube of calyx* adhering to the ovary at the base, and drawn out at the apex into a cylindrical four-cleft tube, whose lobes soon fall off. *Petals* four, alternating with the lobes of the calyx, and inserted in the upper part of the tube ; very rarely wanting. *Stamens* eight. *Ovary* crowned by an urceolate gland. *Styles* filiform, crowned by a capitate stigma. *Berry* oblong or ovate-globose, four-valved, four-celled, many-seeded.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* shrubby, deciduous. *Leaves* opposite or in threes, large, oblong, entire, covered with down, green above, paler beneath, with a rugose surface. *Corymbs* terminal, pendulous, many-flowered. *Calyx* with an exceedingly long tube, funnel-shaped, crimson ; lobes reflexed. *Petals* free, slightly spreading, acute, scarlet, nearly an inch long.

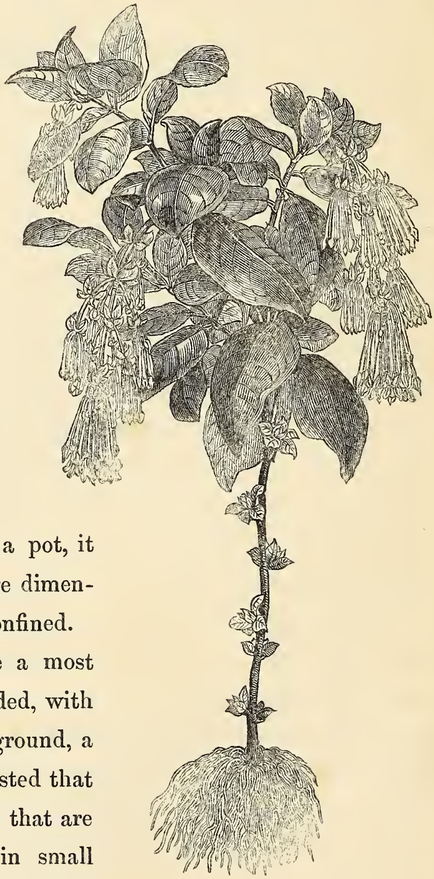
A MORE desirable acquisition to British collections has certainly not been made for some years than the superb Fuchsia of which a figure is now presented. The *F. fulgens*, which was so greatly and deservedly admired on its first introduction, has some peculiarities which detracted much from its real merits, and prevented it from becoming the universal favourite it would otherwise have been. For example, its mode of growth is too luxuriant to admit of its flowering so abundantly as could be wished ; while the production of its flowers in determinate racemes from the extremities of the principal branches alone, also conduced to the same end. The paleness and the shade of green in the tube of its calyx, with its inappropriateness for growing in the open border, have, moreover, tended to check its diffusion.

These characters are not noticed to depreciate a plant that is really ornamental, and which will ever, we should think, form a prominent feature in the greenhouse, as well as afford means for an intermixture of its better properties with those of other species to an indefinite extent ; but simply to show how superior *F. corymbiflora* promises to be in all respects. Our very correct representation will give a good idea of the superlative beauty of the plant ; and what is wanting here, shall be made up from the account which Mr. Standish has obligingly transmitted, and the annexed woodcut.

Seeds of this species were received by Mr. John Standish, nurseryman, of

Bagshot, Surrey, (and, as we may just mention in this place, the originator of the finest hybrid *Fuchsia* we have yet met with, which Dr. Lindley appropriately calls *F. Standishii*,) from some relatives who obtained it near Cusco in Peru. The habit and foliage are similar to those of *F. fulgens*, save that the leaves are thicker, and of a rich bluish green. It bears an immense terminal drooping raceme of flowers, which, says Mr. Standish, "from the beginning of the general flower-stalk to where the first flowers expand, is fifteen inches long, increasing, as the flowers open, to about two feet. The side-racemes hang down so as to hide the stem of the main one when the first flowers fall. It produces three, and sometimes four, side-racemes, which have other smaller ones, that continue in flower for a great length of time."

It will be perceived from our drawing that the calyx of the flower is a deep crimson, the petals being very large and of a bright crimson scarlet hue. The petals are not folded together, as in the common *Fuchsias*, but spread out like those of *F. fulgens*.



Mr. S. informs us that it is far more hardy than *F. fulgens;* growing all the winter in a greenhouse, and thriving in perfection during the summer months if turned out in the open air in an exposed situation. He suggests that the best way to bloom it is to give it this exposure; and as the species is a strong-growing one, it demands a rich soil and plenty of water. If retained in a pot, it should be gradually shifted into one of large dimensions, as the roots will not bear to be too confined.

When once flowered, it is said to be a most abundant-blooming species, quite hard-wooded, with the probability of reaching, in the open ground, a height of ten or twelve feet. It is suggested that cuttings, formed of the points of the shoots that are showing buds, and immediately placed in small pots, in a rich soil, will soon constitute young flowering specimens of the dwarfest description.

OF GARDENING AS A SCIENCE.

NO. I.

In a work devoted ostensibly to ornamental plants, it might appear irregular to introduce subjects connected with general gardening: yet as a few pages are devoted to theoretic and practical inquiries, we may be permitted to avail ourselves of the space so afforded without in any material degree departing from the main object we have in view.

Gardening, as well as agriculture, is conducted upon very lax principles: everything is routine; an overseer orders, and his juniors or labourers obey; no one assigns a reason, and thus *effects* are produced without any inquiry into causes. These facts, which all acknowledge and some lament, indicate, beyond all doubt, that seminaries or institutions are required wherein every element of the art should be strictly investigated by competent persons, and the results be taught to the pupils of the establishment, who should go through a regular course of experiments in all its departments.

The *agricultural* body has at length been partially roused from its state of torpid ignorance; and seminaries or schools of investigation are, at least, suggested; and some preliminary steps have been taken. In France and Germany something tangible is already effected: we may refer, for example, to "Bache's Report on Education in Europe," for a description of "The Institute of Agriculture and Forestry, at Hohenheim, near Stuttgard," which the review in the last number of the British Farmer's Magazine describes as "the most complete agricultural school in Europe."

But we cannot discover one instance of a *Horticultural* school wherein the science of gardening is even alluded to. The Garden of Plants (*Jardin des Plantes*) at Paris, we read, consisted, in 1818, of the open-air departments devoted to the purposes of teaching; wherein there was an indifferent collection of hardy herbaceous plants, and hardy trees and shrubs, with some puerile contrivances to aid the student of agriculture: the plants in the houses were ill cultivated, few in number for such a place, and unworthy of the reputation the garden had acquired. Subsequently, several large stoves and other houses have been erected, "and undoubtedly the establishment is progressing to a better state."

At home, we may direct our attention to the Royal Garden at Kew, wherein only of late years a liberal management has been introduced, rendering the collection as accessible as that of other nations.

The establishments of the London Horticultural Society, the Botanic Gardens at Edinburgh, Liverpool, Cambridge, Oxford, and Chelsea, all have their merits—all diffuse a knowledge of existing plants; but they are not seminaries of scientific education. And as to the provincial Horticultural Societies—*they* stimulate emulation, rivalry, the growth of fine specimens, and anxiety to win a medal or a pecuniary prize; but what do they *teach?* the question is significant, and we leave it to reflection.

What we desire to see, is some grand comprehensive undertaking, wherein every material, everything that can be rendered available to the instruction of youth devoted to the profession, shall be collected, and maintained either directly by the government, or by the united efforts of zealous and affluent individuals, constituting themselves an influential body, (as for example, the now Royal-chartered Society of Agriculture,) and subscribing to funds to purchase a large breadth of land, whereon all the operations of horticulture shall be performed by the students in the open-air departments, and in every variety of glazed or defensive erections, under the supervision of directors qualified to undertake, note down, and record every observable fact and traceable cause. This system would imply courses of lectures on soils, water, moisture, vapour, fermentation, gases; their extrication, mutual attraction, combination, and results; air, light, heat, electricity, galvanism, magnetism. These are all employed by nature, and in full activity; they constitute the class of great natural agents.

Botany, in the most comprehensive sense of the term, would form a very important feature; so would the natural history, climate, introduction of every known plant, and the best method of culture, subject to discovery and improvement. We only suggest, we hardly dare to hope, that any efficient steps will be taken: in the mean time it will be our object to allude, to a greater or less extent, to each of the subjects mentioned—not with any expectation of doing it justice, or of being able to elucidate satisfactorily the phenomena which, at present, we can only contemplate, but in the hope to excite inquiry and admiration, to rouse attention, and stimulate others to do that which we might only expose our own insufficiency by attempting to perform.

Thus far we have ventured upon an imperfect prospectus, introductory of a series of short articles which will follow in succession as far as space may be afforded. It remains to add, that although at the commencement we mentioned general gardening, we have not the slightest intention to notice vegetables. General cultivation is a subject by itself, one which differs widely from science; but as the flower-garden, parterre, shrubberies, and lawn, are each and all dependent upon soil, water, and air, we must allude to those great agents; and therefore the investigation of earth will include the operation of manures. So far, then, the staple of the garden will enter into our plan of analysis; for unless these subjects be inquired into, we shall attain to no means of comparison of facts.

These leading points being explained, we trust that our future articles will neither appear intrusive nor irrelevant.

SUITABLE BORDERS FOR THE CULTIVATION OF TENDER EXOTICS IN THE OPEN AIR.

Every one who cultivates an ornamental garden, even on the smallest scale, is naturally and laudably emulous of adorning it with all those foreign plants which can, by any contrivance, be brought to stand through the winter without being positively destroyed. This desire is, from various causes, as much cherished by the large proprietor, who has roods of ground covered with glass structures, as by the more humble grower who is content with possessing a greenhouse or frame.

It is apparent, therefore, that economy can only be quite a secondary consideration in the attainment of such an object. There is a pleasure to all but the actual culturist in seeing a plant flourish spontaneously, in a free soil, and beneath the open sky, which is never realized by the most perfect comparative success under more artificial conditions. Nor can it be expected that an equal degree of luxuriance should be reached by a species of merely moderate tenderness, in unnatural circumstances, to that which would be manifested when every essential auxiliary was unrestricted.

That many exotic plants, particularly those which grow in a sterile soil, or are periodically exposed to violent changes of temperature or atmosphere, are greatly improved beneath the skilful tendance and care of the gardener, none will be disposed to dispute. Protective houses may, indeed, under certain management, be decidedly advantageous—independently of the temperature they preserve—to some of the species they cover. We do not, consequently, advocate any open-air system with the view of disparaging what has been effected by more refined treatment; but simply because, by a little judicious interference of art, the chief features which occasion superiority in the house may be retained for the open ground, and the additional benefit of whatever agency the natural elements exert be likewise secured.

The purport of the present article, then, is to bring into more extensive notice, and excite to greater assiduity in cultivating, the narrow borders which usually front all kinds of erections with a southern aspect, but especially those connected with plant-houses, or walls on which flowering climbers are trained. Numerous instances, some of which will be duly cited, have presented themselves to our observation, in which borders of this description have been employed for planting out greenhouse shrubs or herbaceous plants, and numbers of tender bulbs, with the most gratifying results; not a few having been thus conserved without the slightest shelter beyond that afforded by the house or wall. Several species, moreover, that are ordinarily kept in the stove, have, in the same situations, created a surpassingly attractive display during summer, and have required nothing more than a little litter thrown over their roots and the lower parts of their stems, or a mat cast loosely around them, in the severest weather.

As it will be exceedingly easy in most places to alter every border of the sort that happens to be possessed, according to the rules now to be suggested, we shall state what, from extensive examination, appears to us to be the best dimensions, height, and mode of preparing such a border. If the trouble which the adoption our hints will cause should form a ground of objection, a comparison between this and what would be necessary if the same species were grown in pots in the greenhouse, will at once show which is the lightest.

At the basis of all attempts of the kind, must be a proper provision for obtaining all the shelter which the wall or structure will afford; for receiving the greatest amount of heat which can be diffused from it, supposing it to need the employment of a fire apparatus; and for maintaining it in the autumn and winter, or throughout entire seasons that are extremely wet, at a tolerable degree of dryness. These precautions cannot be overlooked without more or less diminishing the safety of the system.

To notice them specifically:—In order to ensure a sufficiency of protection from the wall or house, they must, on no account, be below the ordinary height. From ten to twelve feet, or more, seems indispensable for this purpose. It is desirable, too, that they should not occupy an elevated position; otherwise their usefulness would be lessened by the current of cold air which would frequently surround them. For a like reason, if shrubberies, or any erections, stand at a slight distance from them on the eastern side, so as to exclude the keen winds which often blow from that quarter, another important point will be gained.

With the combined object of attaining the condition named in the preceding paragraph, and that of having whatever heat escapes from the house carried as far as practicable through the whole of the border, the latter should never be much more than four feet broad. A width of six or eight feet would take the plants placed near its front beyond the protection of the wall, and also remove them from the agency of the heat given off by the fire used behind or within. Nearly all plant-structures have, or ought to have, their flues or pipes which convey the heat through them, arranged along the front, and only a short distance from the ground. Where much fire-heat is wanted, and even when it is required solely in bad weather, some of it must necessarily pass through the front wall, so that at least a trifling amount of its influence will be experienced in the border. This will not be of service in warming it, nor can it in any way materially affect its temperature; still it is not a warm but a dry soil that is so desirable in winter, and the most trivial assistance of such a sort will be very sensibly useful.

In houses where fires are only occasionally requisite, and the means of heating them are fully adequate, it would be highly advisable to leave small apertures in the front wall, whereby the internal temperature might, to some slight extent, be communicated to the outer border, and so be instrumental in dispelling part of its dampness. On this account, too, the surface of the exterior border should be considerably elevated, that it may approach as nearly as possibly to the level of the hot-water pipes or flues of the heating apparatus inside.

But a great proportion of the heat which a border so situated derives, is attributable to the reflection of the solar rays from the building behind it. Hence its wall, if it have one, or the rafters and sash-bars of the glazed surface composing its front, ought to be painted of that colour which will most readily reflect the light and heat naturally acting upon it. White being undoubtedly the most efficient reflector, should always be preferred; and the basement of a house should be white-washed or stuccoed accordingly.

Perhaps the most influential matter, however, has yet to be mentioned. It is the proper drainage of the border. We are astonished to find that this subject should be so rarely attended to, and that it is scarcely ever allowed the consideration it demands. The drainage of flower-pots containing specimens of exotics is never neglected by persons who understand their culture; nevertheless, unaccountable though it be, when plants of the same, or allied species—or sometimes the identical objects—are turned out of the pots into a border where no facilities are at hand for checking their supply of moisture, nor any control over their appropriation of it possessed—where, moreover, too much water at particular periods is far more likely to prove injurious or fatal—no one appears to think of providing adequate remedies for an undue accumulation of fluids.

We note as an essential point in the naturalization of plants,—whether of the more tender class now under discussion, or belonging to a group which may be regarded as almost hardy, and only liable to detriment from very intense frost, and as well for temporary as for more permanent purposes,—that some proper and sufficient system of drainage must be furnished. All kinds of plants do not retain moisture through the winter to the same extent; but every species that is half-hardy, or is usually grown in a greenhouse, coming from a much warmer climate than that of Britain, is necessarily, on exposure, less likely to have its developments ripened, and inevitably imbibes a greater quantity of moisture than it can evaporate, thus rendering it more subject to the influence of frost.

Assuming the above position established, it is particularly necessary that something which will facilitate drainage should be placed at the bottom of every border intended for the reception of exotics. We would suggest that a border of three or four feet wide be excavated originally to the depth of eighteen inches below the walk that is before it; that six inches of broken bricks, coarse gravel, scoriæ, cinders, or stone, be laid in the bottom, over which the soil can be introduced to a level with the walk in front, and six inches higher at the back. If the garden be in a country where stone is abundant, a rough drain can likewise be made along the front of the border, at the depth before mentioned, which will greatly aid in carrying off the superfluous water.

The body of earth thus formed will be from one foot to eighteen inches thick.

This will be ample enough for all the plants that can be introduced to it, as, if there were more, it would merely increase the liability to saturation; and the necessity for allowing the roots of shrubby species to strike deeper, for the sake of making them more impervious to frost, will be obviated by strewing a quantity of dry litter over the surface of the soil while winter lasts.

In the choice of compost for such a border, regard must, of course, be had to the tribe of plants wished to be grown. A miscellaneous and mixed collection is, however, so much to be desired, that all which can be done on this head is to prepare a soil that will be generally suitable, and add any ingredient in the spot where particular species are to be planted that may be deemed requisite. Bearing in mind the circumstance to which we have already alluded, that there will be a perpetual disposition in plants so exposed to imbibe moisture too freely, and considering, farther, that exuberance will be an unavoidable result of unlimited supply; while we know that succulence and great luxuriance are both to be shunned, we shall do well to select an earth which is not peculiarly rich in nutriment, or of an adhesive or boggy nature. The common soil of the garden is by no means to be used. A fine light loam, taken from the field, and having all its vegetable constituents decomposed by lying in the compost-yard for a year previously, should be the principal ingredient, or nearly two-thirds. To this may be added about one-third of open heath soil, that has been similarly exposed to the atmosphere, and a small quantity of sand will complete the composition.

If it be fancied that such attention to soil is needless, it should be remembered that fully as much pains would have been bestowed on the plants had they been potted. In fact, the kind of compost which would have been given to them when in pots, will be a good criterion for determining the quality of that allowed them in the border; since the last should be somewhat less nutritive, owing to the liberal manner in which it will be afforded, and the stronger stimulation, by means of more water and direct solar agency, to which they will be subjected.

As an appropriate conclusion to this paper, we shall point out, generally, the kinds of plants to which such treatment is applicable, reserving for a future occasion the specification of a few to which our attention has been strongly directed. Taking a comprehensive view, it may be observed that evergreen shrubs are least of all adapted for the purpose. There are no plants that can be so disadvantageously covered in the winter as evergreens; for it is at that season they exhibit their greatest beauty. Neither are there any which are so susceptible of damage, on account of the constant verdure of their foliage, and the more extensive circulation of their fluids during winter.

Among the deciduous sorts of shrubs, there is a class which will bear to have their shoots killed annually, and renew them in much greater numbers and vigour in the ensuing spring. The genus *Fuchsia* may be noticed as presenting an example of the kind. All the Fuchsias would be excellent subjects for assisting in composing a border of the description herein treated of. By fastening a little dry hay, or some similar material, over the ground above their roots, they can be preserved with the most perfect ease. And there cannot be a doubt that every greenhouse plant at all related to them in habit, would thrive equally well under the same treatment.

Another group, comprising all the species known by the name of herbaceous plants, is strikingly suitable for planting in borders. The beautiful tender species of *Pentstemon* would make a conspicuous feature in the collection ; but, being evergreens, there is some difficulty in conserving them during the winter season. The best plan for sheltering such plants, would be to erect a trifling temporary frame of wood over the border in the autumn, and throw mats or other coverings over it when the frost is severe. Probably a covering of pitched canvas would be the most serviceable ; for this would exclude both heavy rains and frost, and the former are ofttimes the most dangerous.

The last class to be named includes a variety of bulbous plants, such as several species of *Amaryllis*, *Nerine*, *Calostemma*, &c. ; with a quantity of corms from the genera *Gladiolus*, *Tigridia*, *Ixia*, &c. To prevent that disagreeable blankness which would occur at stated periods, were these plants placed in a compartment by themselves, they should be interspersed with other species along the border, and taken up yearly, for a few weeks in the autumn. The mode of protection recommended for herbaceous plants might be adopted very easily in this case likewise.

A reference has above been made to the advisability of leaving holes in the front wall of a greenhouse, that its heat may be admitted to the border. In quitting the topic, we shall suggest another use for these apertures. The climbers trained up the rafters of a greenhouse are, it is well known, too generally planted in tubs, boxes, or beds, where neither the atmosphere nor the sun can ever act upon their roots. The consequence is that the soil becomes loaded with stagnant water, and an unhealthy state is speedily produced. Our proposition is to plant these climbers in the outside border, to introduce their stems at a few inches below the surface of the soil into the house through the apertures we have mentioned, and thus render the plants at once healthy, luxuriant, and prolific of flowers.

TREATMENT OF LEYCESTERIA FORMOSA.

FROM the great lack of handsome dwarf deciduous shrubs in British gardens, and their deeply interesting nature, it is to be presumed that every valuable accession will be highly prized. There are not wanting, it is true, multitudes of the kind belonging to certain classes, and of this the Rose and Azalea afford excellent proof. But it will be admitted that a much more extensive variety of forms than we yet possess, and such as are capable of being cultivated in a simple manner, is a standing desideratum.

The beautiful shrub which forms the subject of these remarks is admirably calculated to contribute towards filling up the blank here spoken of, if its adaptation and general merits were better known. And that these may no longer remain a secret to the many who would delight in cultivating it, we devote the present page to its commendation.

It is said to have been introduced to England in 1824, and to have first flowered in the nursery of Messrs. Allen and Rogers, Battersea. From that time, however, till its re-introduction about four or five years ago, it was kept in complete obscurity. In 1837, it blossomed in several collections; and it then began to be seen that it was likely to be a very ornamental shrub, although its hardihood was rather uncertain, and it exhibited a tendency to grow in a somewhat straggling manner.

Treated as a greenhouse plant, or trained against a sheltered wall, the old stems become very unsightly; and it does not flower either in profusion or perfection. Being a native of Nepal, from a mountainous district 6000 and sometimes 8000 feet above the sea, and thriving in pine and oak forests, it was reasonable to suppose that it would be nearly hardy. Still, when exposed to the winter vicissitudes of our climate, its stems were greatly injured, and it was feared that, as a border shrub, British cultivators must abandon all hopes of seeing it thrive.

Such apprehensions have, from longer experience, been demonstrated to be groundless. In the autumn of 1839, we saw plants in the garden of R. Barclay, Esq., Bury Hill, Dorking, Surrey, which satisfied us that it is one of the most useful and interesting shrubs now cultivated in this country. Planted in an open bed, in common soil, it there has all its stems destroyed yearly in the winter, but only to be succeeded by double the number in the following spring. None of its naturally rambling character is consequently displayed; and it does not grow taller than from two to three feet, with leaves nearly to the bottom of its stems.

When we saw the specimens in question, they had probably no less than thirty stems, from each of which several large racemes of lovely white flowers were produced; the absence of colour being relieved by the showy purplish crimson of the bracts. It continues blooming for several months, and the fine purple berries which succeed the flowers are almost as attractive as the blossoms themselves. Not the slightest protection is given; and in very cold localities, a mulching of any dry material around the base of the stems would certainly be an adequate security from frost.

How admirably this plant is suited for ornamenting beds, borders, or plantations, we need not farther state. As it can be propagated most abundantly by cuttings, or seeds, or division at the roots, we hope it will be largely employed both as a flower-border shrub, and for an undergrowth to pleasure-ground shrubberies and woods.

POTS FOR EARLY CROCUSES AND BULBS.

The practice of growing Crocuses and other dwarf bulbous plants in pots, for decorating greenhouses and drawing-room windows, has most likely been common in Britain from the period when the first attempts at cultivating potted exotics were made. Since then, the varieties have been so wonderfully improved and increased, that the most fashionable floriculturists of the present day continue to avail themselves of similar ornaments.

Such a striking refinement of taste has, however, accompanied, or perhaps produced, the melioration of flowers, that ordinary garden-pots have been in some measure discarded from the above service; and in the case of the lower and more compact-growing kinds, a species of ornamental receptacle, capable of admitting a greater quantity of plants, and showing them to better advantage, has formed an agreeable substitute.

In several suburban gardens, and also in the windows of some of the London tradesmen, we have seen a sort of saucepan-shaped flower-pot, with a convex bottom, destitute of edges, freely perforated with holes, and placed in an inverted position, made use of for Crocuses. We consider this objectionable, because its appearance is anything but pleasing, and there is a difficulty in supplying the plants with water.

Believing that the employment of any such expedient furnishes an interesting feature to both the greenhouse and drawing-room, especially to the latter, and that the usual forms of pots in which these plants are kept are susceptible of considerable improvement, we lay before our readers the simple opinions we entertain on the subject. The shape best adapted for the object is obviously a pyramidal one, with a flat open space at the top, and a rim half an inch broad, inclining outwards, with another rim at the base, about the same distance below the bottom of the frame, to allow the water to drain off readily.

The material we should employ would be wood, because this can be manufactured into any desired form; and although less durable than earthenware, it can be painted so as to last a considerable time, and may be renewed at pleasure at a very trifling expense. The whole of the sides and top should be bored with round holes, about an inch apart, and half an inch in diameter; and the bottom must be made to slide in and out as may be required. The size can be varied from four to six or eight inches diameter at the base, and a proportionate height. In painting them a green colour is to be chosen, as being more lively and natural.

With reference to the period for introducing crocuses, dwarf tulips, or any small bulbs, the month of November should be preferred; but they can be taken from the ground or from pots at the present time, and their stems placed through the holes, making the soil up carefully about their roots. A sandy loam is the most proper earth, and the frame can be inverted between two trestles during the operation. If the varieties be judiciously disposed with regard to their colour, they will constitute a most brilliant and alluring display.

Where the common flats, which are placed beneath flower-pots, cannot conveniently be used, a small drawer lined with tin or zinc may be made at the bottom, to catch all the water administered as it drains through. The plants must be placed in a light situation, watered daily, or once in two days, though not very abundantly, and suffered gradually to wither about two months after the flowers fade. We commend the adoption of such receptacles to all who feel an interest in watching vegetable developments, or who seek to banish the idea of winter, and anticipate the charms of spring.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER AND JANUARY.

Angelònia cornígera. A very free-flowering species, discovered by Mr. Gardner in Brazil, and forwarded to the Glasgow Botanic Garden, where it flowered during the last season. It is a hairy, upright, branching plant, with narrow leaves, and occasionally a little ciliated at their base. The flowers are axillary, solitary, of a beautiful bluish-purple colour, which becomes darker about the middle, and having a "large and conspicuous horn-like appendage arising from the middle segment of the lower lip, and directed towards the centre." It has been kept in a stove, but would probably flourish with the heat of a greenhouse. Being found in sandy places, a large proportion of sand should be blended with the soil in which it is potted. *Bot. Mag.* 3848.

Catasètum callòsum, &c. Several species of *Catasetum*, whose pseudo-bulbs and leaves so greatly assimilate as not to require particular delineation, are figured in the same plate. *C. callosum* has flowers in which the sepals and petals are dull reddish brown, without spots; and the lip is pale green, flat, and has a small yellow protuberance at its base, with a blotch of the same hue near the extremity. Messrs. Loddiges introduced it from La Guayra. *C. cornutum* bears very long racemes of flowers, the individual ones being green, profusely spotted with dark purple, while the labellum is of the like colour, very imperfectly fringed, and having a strong inflexed white horn towards the base. It was imported from Demerara by Messrs. Loddiges. *C. lanciferum* has singular purplish flowers, with a white entire lip, and was received from Brazil by the Hon. and very Rev. W. Herbert.

Echevèria lùrida. Differing but slightly from *E. secunda*, except in "having longer and more blunt leaves, which are deeply stained with dull purple. The flowers too are a richer scarlet." It is a showy greenhouse perennial, requiring to be treated as the more tender species of *Mesembryanthemum*. The temperature of a stove is not necessary; but it must not be placed in the open air in summer. A mixture of leaf-mould and brick-rubbish is recommended as a proper compost, "covering the surface of the pot with silver sand." *Bot. Reg.* 1.

Euthàles macrophýlla. From *E. trinervis*, the original species, this plant differs in having "a strong erect branched stem, with broad deep green leaves, as much as six inches long." It is a greenhouse herbaceous perennial, growing from three to four feet in height, and bearing a great number of showy yellow and brown blossoms throughout the whole of the summer and autumn. It is suggested that plants placed against a south wall would succeed well in the warmer months; but they must be taken up and sheltered for the winter. Any rich soil seems to suit it, and it is propagated by cuttings. Seeds having been sent to Captain James Mangles, R.N., and presented to the Horticultural Society, plants were raised and flowered in the Chiswick garden in June, 1840. *Bot. Reg.* 3.

Gerànium rubifòlium. A handsome border plant, of an erect habitude, with large three-lobed leaves, and fine pinkish-purple flowers. Seeds of it were given to the Horticultural Society in May, 1839, by Dr. Royle, who brought them from the Himalayan mountains. "It is a neat hardy perennial, by no means so robust a grower as many of the other hardy Geraniums, scarcely exceeding a foot in height." A light soil, and a position on dry rockwork, are necessary in its culture, as it will not endure much moisture in winter. July and August are its flowering months, and it is increased by division, "or by seeds, which are produced freely, but the seedlings will not flower before the second season." *Bot. Reg.* 67.

Gongòra bufònia. It appears to us that the numerous kinds of *Gongora* at present in the country are nearly all modifications of one type, or varieties of a single species. The plant now before us is said to be distinguished by the singular colour of its blosoms, which is a dingy yellow ground, stained with dull reddish-purple, and by having a longer lip and longer bristles than *G. nigrita.* To the cultivator it will have few attractions, as the want of lively colours must prevent any *Gongora* from becoming popular. S. Rucker, Esq., of Wandsworth, received it from a friend who had obtained it from Brazil, and it flowered in the collection of this gentleman, who describes the pseudo-bulbs and leaves as being of a pale whitish-green. *Bot. Reg.* 2.

Grabówskia duplicàta. With straggling stems, which are usually about twelve feet high, slightly spinous branches, broad and wavy foliage, and small greenish-brown flowers, produced in axillary fascicles, this shrub has not much to recommend it to notice. Seeds were collected by Mr. Tweedie in Buenos Ayres, and sent to Mr. Moore, of the Glasnevin Botanic Garden, where plants flowered in July, 1840. The temperature of the stove seems to be requisite, and the plant does not blossom abundantly. "The essential character of our species is the singular inflation at the base of the (interior of the) segments of the calyx, which rises into a tooth-like form." Its habit is like that of some species of *Lycium. Bot. Mag.* 3841.

Isomèris arbòrea. At first sight, the flowers of this plant are said to be not very dissimilar to those of an *Edwardsia*, though chiefly so from their yellow colour. It was found by Mr. Nuttall in California, and transmitted by Mr. Buist of Philadelphia, to two of the Scotch establishments, in 1839. Kept in a greenhouse, it has not yet flowered; but a plant having been placed in the stove at the gardens of the Caledonian Horticultural Society, bloomed in May, 1840. It has erect hoary branches, with trifoliate leaves, which gives it the appearance of a *Genista*. The blossoms are axillary, but likewise collected into a kind of raceme at the ends of the shoots. They are pale yellow, with a faint offensive odour, and have their large conspicuous capsule protruded considerably beyond them. "Mr. James M'Nab thinks that the flowering was promoted by his having forcibly retained the top in a depending position." *Bot. Mag.* 3842.

Málva laterítia. Mr. Tweedie, of Buenos Ayres, sent seeds of this plant from Entre Rios to the Dublin College Botanic Garden, where specimens blossomed in the open border, in September of last year. It is an herbaceous species, with prostrate stems, ordinary leaves, peculiarly long flower-stalks, and moderately large pale rosy-red flowers, which have a few darker streaks, and a blotch near the base of each of their petals. Doubtless the species is, from its character, adapted for planting in beds, but we should think it too luxuriant and diffuse to be very ornamental. *Bot. Mag.*, 3846.

Martýnia fràgrans. One of the handsomest annuals that have been introduced for many years. It has a solitary stem, which begins to flower when at the height of one foot, and continues branching, and flowering from all its branches, till it forms a specimen of three feet high, and the same in diameter. The foliage is large and copious, and the flowers are borne in upright racemes. They remind us, in form and colour, of the beautiful *Gloxinia rubra*, being, however, of a somewhat darker red, with an apparently yellowish throat. It is a native of Mexico, from the neighbourhood of the Real del Monte mines, and was sent to Mr. Marnock, nurseryman of Hackney, by whom it has been flowered. The treatment given to Balsams is supposed to be most favourable. It may be raised and grown in a gentle moist heat, and bloomed in a cold frame or greenhouse. In addition to its great beauty, the flowers are highly fragrant. *Bot. Reg.* 6.

Monolòpia màjor. Described as growing naturally to only a foot in height, but constituting a rank and rather coarse annual, with two or three feet of stem, under British cultivation. It has strong stems, covered with whitish down, and manifesting a trifling disposition to branch; the leaves are strap-shaped, but a little broader at the base, obtuse, and obscurely toothed. A large and deep yellow flower crowns each of the branches; and these blossoms are noticed as showy, and as continuing in perfection most of the summer months. It was brought from California by Mr. Douglas, and sometimes bears the name of *Helenium Douglasii*. It is most probably hardy. *Bot. Mag.* 3839.

Oncídium macranthèrum. We have no doubt that this is identical with a pretty little plant we saw blooming at Messrs. Rollison's, Tooting, about two months since, and which we then found some difficulty in ranking as an *Oncidium*. In the specimen represented, two or three flowers only are shown on each raceme; but on the one to which we have referred, several extensive racemes of from twelve to fifteen blossoms were produced. It is a small species, with few and diminutive pseudo-bulbs, and flowers of a yellowish green-ground, having the lip blotched with purple. The anthers are peculiarly large; and we observed that the form of the anther-case bore a striking resemblance to the head of a greyhound in figure. Plants were collected by Mr. Galeotti in the interior of Mexico, and some of these which were forwarded to the Woburn collection flowered in April, 1840. *Bot. Mag.* 3845.

ORTHOSÌPHON INCÚRVUS. From the gardens of His Grace the Duke of Northumberland, at Sion House, this plant was furnished to the Edinburgh Botanical establishment in 1839, where it blossomed in the stove in the following May and June. It is a sub-shrubby species, of a very peculiar character, but not much unlike, in general appearance, *Stachys coccinea;* having much paler flowers, and a curiously toothed calyx, tipped with pink. It is evidently an interesting object, and might most likely be grown in a greenhouse, or, perhaps, in the open ground for a few months, since it comes from the *mountainous* parts of Sylhet. The leaves are simple, ovate, and crenated; and the blossoms appear in tall ascending spikes, being of a pale pink colour. *Bot. Mag.* 3847.

PÙYA HETEROPHÝLLA. This pretty plant is rendered remarkable by having two sorts of leaves: the lowermost ones, or those immediately around the bulb-like stem, being brown, horny, narrow, and furnished with prickly processes at their sides, while the upper ones are green, lanceolate, of the usual texture, and without any kind of armature. The flowers are borne in a dense spike, from the midst of a number of large bracts, and form the centre of the plant. It was received by J. Rogers, Esq., jun., of Sevenoaks, from Mr. Parkinson of Mexico, in 1838, and having been managed as a *Tillandsia,* it bloomed in May, 1840. The heat and moisture of the Orchidaceous-house suit it admirably when growing, but it must be kept cool and dry during winter, in order to develop its flowers. *Bot. Reg.* 71.

SPIRÆA KAMTCHÁTICA; *var.* HIMALÉNSIS. Exceeding like the *Spiræa ulmaria* of British meadows, but, perhaps, a little more ornamental. It inhabits various parts of the Himalaya mountains, and is very nearly related to *S. Kamtchatica,* "from which it scarcely seems to differ, except in having the leaves white with down underneath," and their segments somewhat less acuminate. It was raised in the garden of the Horticultural Society from seeds brought home by Dr. Royle, and thrives well when treated like *S. Filipendula*, preferring a damp and partially shaded situation. *Bot. Reg.* 4.

TROPÆOLUM MORITZIÀNUM. A charming new *Tropæolum*, with peltate leaves, of the same class as those of *T. majus*, climbing stems, and splendid orange and yellow flowers, the margins on the petals of which are extensively lacerated. Mr.

Lockhart of Trinidad, having procured the seeds from Cumana, gave some to Mr. Murray of the Glasgow Botanic Garden. "They soon vegetated, and the plants blossomed in July, 1840, for the first time, in the greenhouse." Others that were planted in the open border, grew more luxuriantly, but did not flower. It will constitute a most elegant addition to the genus, and is expected to bloom out of doors in favourable seasons. *Bot. Mag.* 3844.

NEW, RARE, OR INTERESTING PLANTS THAT HAVE RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES.

Epiphýllum purpuráscens. A most delightful species of *Epyphyllum*, nearly related to *E. truncatum*, but to which we think the above name applicable, on account of the delicate, though not decided, purple hue of its flowers, has been imported by Messrs. Rollison, Tooting, from Brazil, and many specimens of it have flowered in their nursery. There is but a slight difference between its habit and that of *E. truncatum*. In the latter, the stems are flatter and less rugged, and the leafy portions rather broader, and more truncate, with somewhat fewer clusters of aculei. The tube of the flowers of our present subject, and the base of its sepals and petals, is of pure transparent white, while their spreading portions, the circular mark round their throat, and the stigma and style, are of a lovely vermilion purple, which cannot be described. It is an exceedingly ornamental object.

Péntstemon gentianoìdes, *vars.* Two or three valuable varieties of this much-admired and useful plant have flowered during the summer of 1840 in the metropolitan collections. One, called *coccineus*, and which was bloomed by Mr. Low, of Clapton, in 1839, has flowers of a hue so much lighter than that of the old species, as to make a very near approach to brick red or scarlet, with the markings in the interior much plainer and more beautiful. The plant named *P. fruticosus* is, in our opinion, so extremely like the preceding variety, that the only discernible difference may be easily ascribed to a dissimilarity in its treatment. Another, designated *splendens*, is superior to the rest in the size of its flowers, and the more spreading character of their mouth; the colour being more crimson than that of the variety *coccineus*. They are particularly desirable for flower-gardens and borders, and may be procured of most nurserymen. We have seen the *splendens* chiefly in the Clapton nursery.

Saccolàbium —? A charming little Orchidaceous plant, apparently allied to both the genera *Saccolabium* and *Aerides*, but with a lip which differs in its form from either, is blooming at Messrs. Loddiges' nursery. It has a short stem, and large long leaves, which last are remarkable for the conspicuous longitudinal lines of alternate dark and light green throughout their surface. The flowers are produced on a partially-drooping raceme, are as large as those of *Aerides odorata*, of a whitish ground, with a purple blotch at the extremity of each sepal and petal, and a few spots of a similar hue. The labellum is flat, with small raised parallel plates, and of a pinkish-purple colour. It is most deliciously fragrant.

Stanhòpea —? Perhaps the handsomest species of this splendid genus, and one which seems to be quite new, is at present blossoming with Messrs. Loddiges. The pseudo-bulbs are not peculiar, but the leaves are very broad and of a strikingly deep green. A long pendulous raceme, bearing seven or eight noble flowers, is now protruded, and the individual blossoms are exceedingly interesting. The ground colour of the sepals is a light, though decided, orange, with numerous spots of pale purple, afer the manner of *S. oculata*, but smaller. The petals are narrow, inclining upwards, beautifully undulated at the margins, and folded back at the point, of a deeper orange than the sepals, and having fewer as well as darker and more uniform spots. The lip is dark orange, with a blotch of purple on each side, and pale yellowish-orange appendages, which are polished on the upper surface, and sparingly spotted. The species is remarkable for the vivid-orange colour of its flowers, which gives it a most fascinating appearance ; and its attraction is increased by the powerful and rich odour they exhale.

OPERATIONS FOR FEBRUARY.

After the extremely rigorous weather latterly experienced shall have departed, it will be necessary for the gardener to adopt many measures in plant-houses for weakening its effects, and also speedily to perform several operations in the garden which have been unavoidably deferred. While it continues, however, the houses and frames should be kept covered with mats, and the plants in them preserved at a degree of dryness verging on absolute want.

It is very rarely that a plant is lost in winter by being allowed an insufficient quantity of water, but the numbers that are destroyed from a contrary cause, are incalculable. Every plant has a greater or less supply of young and tender rootlets, on which its health and sometimes its vitality are wholly dependent. When the soil in which these are growing is suffered to become very moist, as it is in several of the places we have recently seen, a slight frost that enters the greenhouse will inevitably congeal the water in the earth, and cause all those valuable roots to perish. The admission of frost to such structures being by no means of rare occurrence in changeable seasons, the injury we have mentioned must be equally frequent when much moisture is present in the soil. If, on the other hand, a long previous period of comparative drought has been maintained, and both the soil and the plants are actually as dry as they can consistently be kept, no damage of the kind will accrue, for they will then endure a few degrees of frost with impunity.

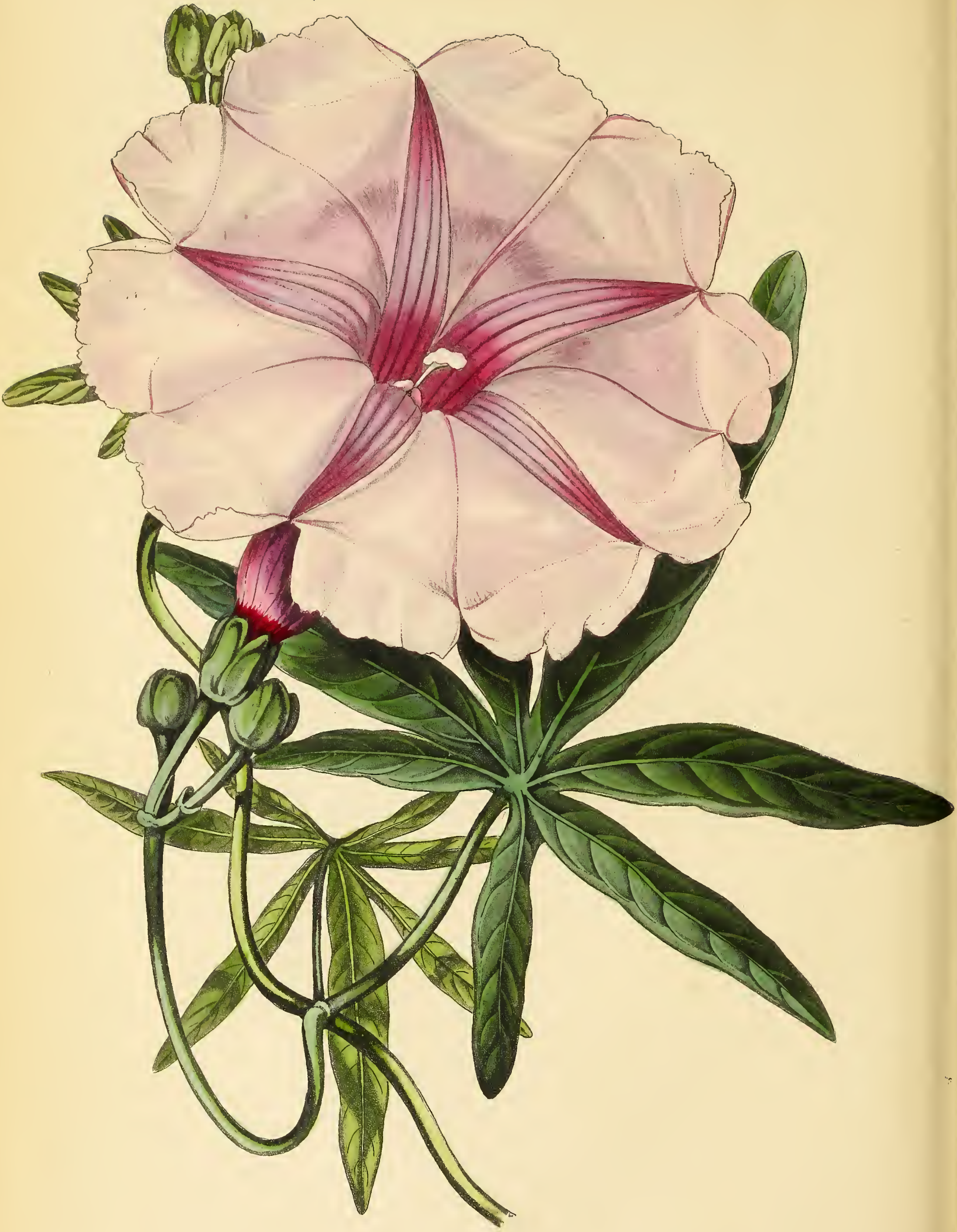
With regard to the external protection of plant-structures and frames that are capable of being artificially heated, the practice seems to have been exceedingly common in the earlier periods of gardening, and is now pursued by most nurserymen, though it is seldom employed in private establishments. Wooden shutters, indeed, were formerly used for greenhouses, and might yet be made highly useful in covering those pits or houses which contain nothing but hard-wooded plants, whether evergreen or deciduous, that are not likely to commence growing in winter. Their adoption should, nevertheless, be limited to extreme cases, when the frost is either very intense or durable. Mats or straw hurdles being more easily prepared, and less expensive, should have the preference for ordinary purposes, and cannot with propriety be dispensed with where economy or the superior health of the plants is sought. When the rafters of the house project beyond the level of the glass, straw hurdles formed of a slight frame-work of wood, with the straw laid between it flatly and longitudinally, and made to pass alternately on each side of small cross bars, to which it can be secured, might be drawn up by pulleys, fixed on the outside at the top of the house, and would thus almost supersede the use of fire. In some way or other, an outer screen appears to us to be indispensable.

When the weather will permit, the chief aim of the culturist should be to throw open his greenhouses and frames as much as practicable, in order to repress any tendency to begin growing too soon that may have been excited by confinement, or the application of fire-heat. This is one of the great evils of all greenhouse cultivation. And in long winters like the present, it is, of course, seriously aggravated. Heat of any sort, applied to exotic plants, naturally stimulates them to development; and if partial darkness accompany it, their development is always weak and imperfect. With greenhouse species, and those half-hardy plants that are in reserve for the flower-garden, any such precocious growth leaves a feebleness throughout the entire season, and their flowers are never so fine. Therefore, as the sole method of counteracting it, air should now be admitted liberally at all times when it is not freezing, or excessively damp.

The severity of the winter gives an unprecedented opportunity for examining the merits of the different systems of heating; which, we trust, will be universally seized. It is, without question, of the utmost moment to determine by what method the greatest surface of glass and volume of air can be heated to a given degree, in the least time, with the smallest consumption of the cheapest fuel; and if practical men will make known the results of their experience in the present winter, ever taking into account the influence of peculiar localities and circumstances, we anticipate that great good will be effected. Facts, rather than opinions, should constitute the subject of such communications, which may be sent to any suitable or favourite periodical. For ourselves, we shall gladly profit by any information on this topic.

Tender annuals may be sown towards the end of the month, in either frames, pots, or beds covered with mats or canvas. Dahlias, too, can be started for propagation. In neither instance should much heat be applied, but a gradual and vigorous growth induced.

The out-door operations for the month are pruning, layering Roses, &c., removing superfluous suckers from about the roots of flowering shrubs, digging over the borders that have not before been turned, preparing beds for summer flowers, exposing all covered plants on fine days, propagating hardy trees and shrubs, and numerous other matters which are too minute or too well known to be individually noticed.



Batatas bonariensis.

BATÀTAS BONARIÉNSIS.

(BUENOS AYRES BATATAS.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
CONVOLVULÀCEÆ.

GENERIC CHARACTER.—*Calyx* of five sepals. *Corolla* campanulate. *Stamens* inclosed. *Style* one. *Stigma* capitate, two-lobed. *Ovarium* four-celled, or only three-celled by abortion.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* an herbaceous climbing perennial. *Root* a bulb-like tuber. *Stems* twining, extending twenty or thirty feet. *Leaves,* on old plants, deeply divided into seven lanceolate segments ; those on younger specimens having only five lobes, smooth. *Peduncles* bearing one or more flowers. *Calyx* short, with oblong sepals. *Corolla* deep pink, large, handsome.

SYNONYME.—*Ipomœa bonariensis.*

THE genus *Batatas* is very nearly allied to *Ipomœa*, and constitutes one of the modern divisions into which that old and well-known group has been broken up. There does not appear to be any difference in the habits of the plants or the structure of the flowers ; and the distinction is, we believe, chiefly founded on the number of cells in the ovary, *Batatas* usually having four, while *Ipomœa* has only two.

The species here figured is a new and extremely beautiful climber, of which seeds or roots have been imported from Buenos Ayres by several nurserymen. It was collected by Mr. Tweedie in the neighbouring district, and introduced to this country in the year 1839.

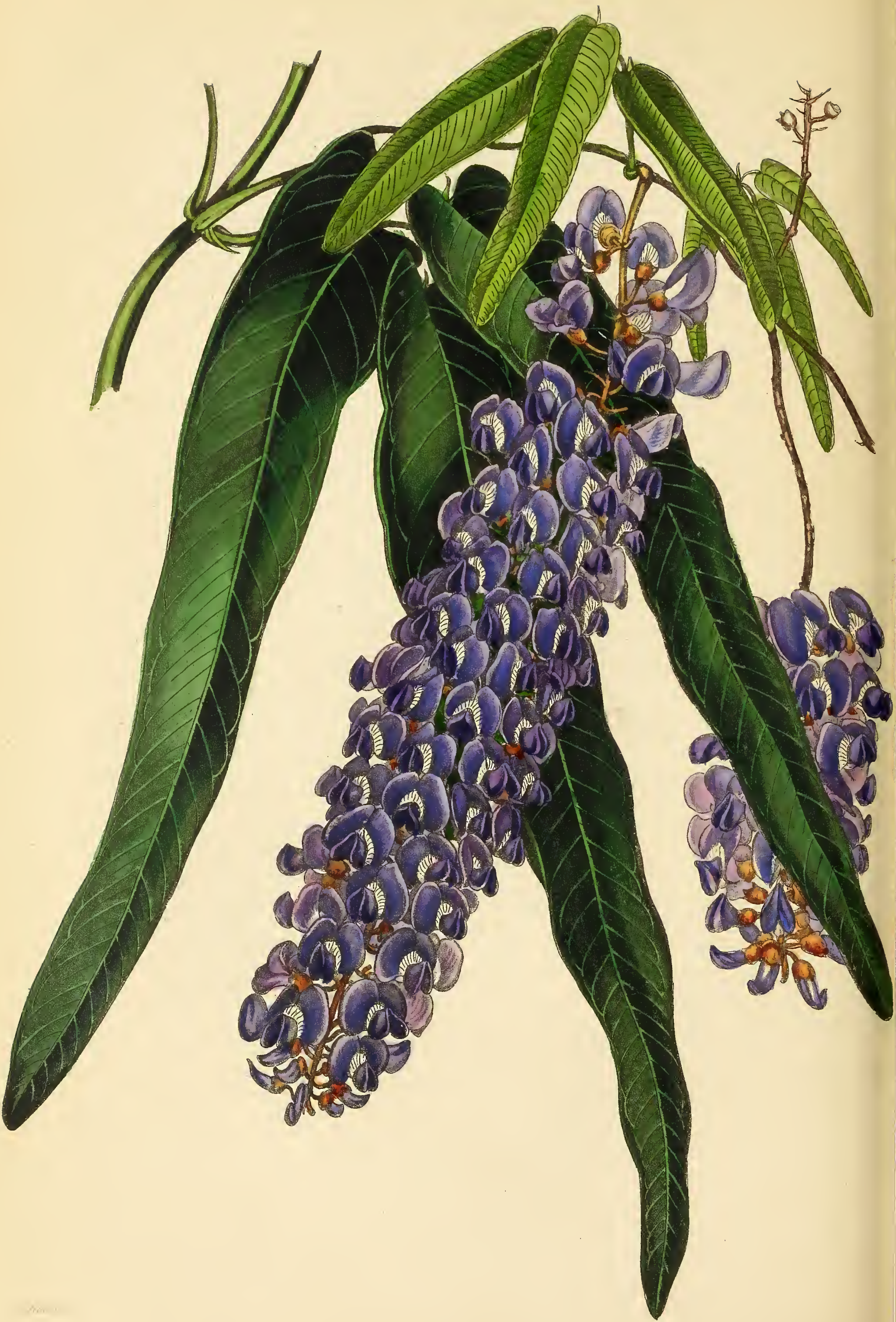
It is readily distinguished from its congeners by its pale-green, deeply divided leaves, which, on old specimens, have always seven segments, while younger plants rarely produce more than five. Plants have, we are told, been cultivated in the greenhouse at the Clapton nursery ; and probably the colour of the flower would be deeper on such specimens than on that exhibited in our plate. The only treatment to which we have seen it subjected is that of a stove climber ; and the plant from which we obtained our drawing in September last, grew most luxuriantly in the stove of Messrs. Rollisson, Tooting.

Being an herbaceous species, with tuberous roots, the stems decay annually, and the plant requires to be kept quite dry during the winter season. It may be placed, for this period, on any dry shelf in a warm shed, taking care to preserve it alike from frost and shrivelling. About the beginning of the present month it should be repotted in a rather rich loamy soil, with which a very little heath-mould and sand may be incorporated, and removed to a stove of moderate temperature. If watered sufficiently, it will bear shoots of from fifteen to twenty feet long during the summer; and these, if trained in opposite directions, will cover a very considerable portion of a small house. Early in the autumn, or towards the close of summer, the flowers will commence developing, and maintain a constant display for several months.

On account of its herbaceous nature, it is not adapted for planting in the bed or border of a stove as a permanent ornament, but succeeds best when retained in a pot. As the flowers are unusually large, very numerous, and of a fine deep pink colour, it is a particularly desirable species for stoves. If consigned to the greenhouse, the management we have recommended can be pursued with equal propriety; though we doubt whether it would be so showy or so prolific of flowers in a low temperature.

Cuttings of the young wood root freely when planted in a sandy soil, and placed beneath an occasionally shaded hand-glass, in the stove. If planted late in the season, they will retain their stems and foliage through the winter; but it is advisable to raise them in spring, on account of their liability to injury from dampness when kept in a growing state for the winter.

Batatas is said by Rumphius to be the Malay name of one of the species, and by Nieremberg to be of Mexican origin. The specific name refers to the native country of the plant.



Hardenbergia Comptoniana

HARDENBÈRGIA COMPTONIÀNA.

(LADY NORTHAMPTON'S HARDENBERGIA.)

CLASS. DIADELPHIA. ORDER. DECANDRIA.

NATURAL ORDER. LEGUMINÒSÆ.

Generic Character.—*Calyx* campanulate, shortly five-toothed, usually two-lipped. *Standard of the corolla* roundish, nearly entire, narrow at the base, without appendages, scarcely clawed, longer than the wings. *Wings* obliquely oblong-obovate. *Keel* adhering to the wings below the middle, and somewhat shorter, incurved, obtuse. *Stamens* distinctly diadelphous. *Filaments* clearly inarticulated to the base of the standard. *Ovary* composed of many ovules. *Style* short, ascending, awl-shaped. *Stigma* capitate, slightly lined. *Legume* linear, compressed. *Seeds* strophiolate.

Specific Character.—*Plant* a climbing evergreen shrub. *Stems* branched; branches round, slightly four-cornered. *Leaves* ternate, petiolate, distant; leaflets oblong-ovate, rounded at the end, mucronate, nettedly veined, very long, middle one a little the largest. *Stipules* minute, reddish. *Racemes* axillary, many-flowered. *Flowers* in alternate pairs. *Standard* bluish purple, with a white fringed spot in the middle. *Wings* and *keel* of a similar colour.

Synonymes.—*Kennedya Comptoniana. Glycine Comptoniana.*

When this charming climbing plant was first made known in British botanical works, it received, provisionally, the name of *Glycine Comptoniana;* not that it was thought to bear a sufficient relation to that genus to establish it as an unquestionable species, but because its affinity to *Glycine* was considered greater than to any other genus that had then been defined.

In the nurseries and gardens of this country, however, it for a long time bore the title of *Kennedya Comptoniana;* and, indeed, it is still known by that appellation in many establishments. From *Kennedya* it was always deemed distinct by Mr. Brown, and it has at length been ranked with one or two other supposed *Kennedyas* and some new species, as a separate genus, under the designation of *Hardenbergia.*

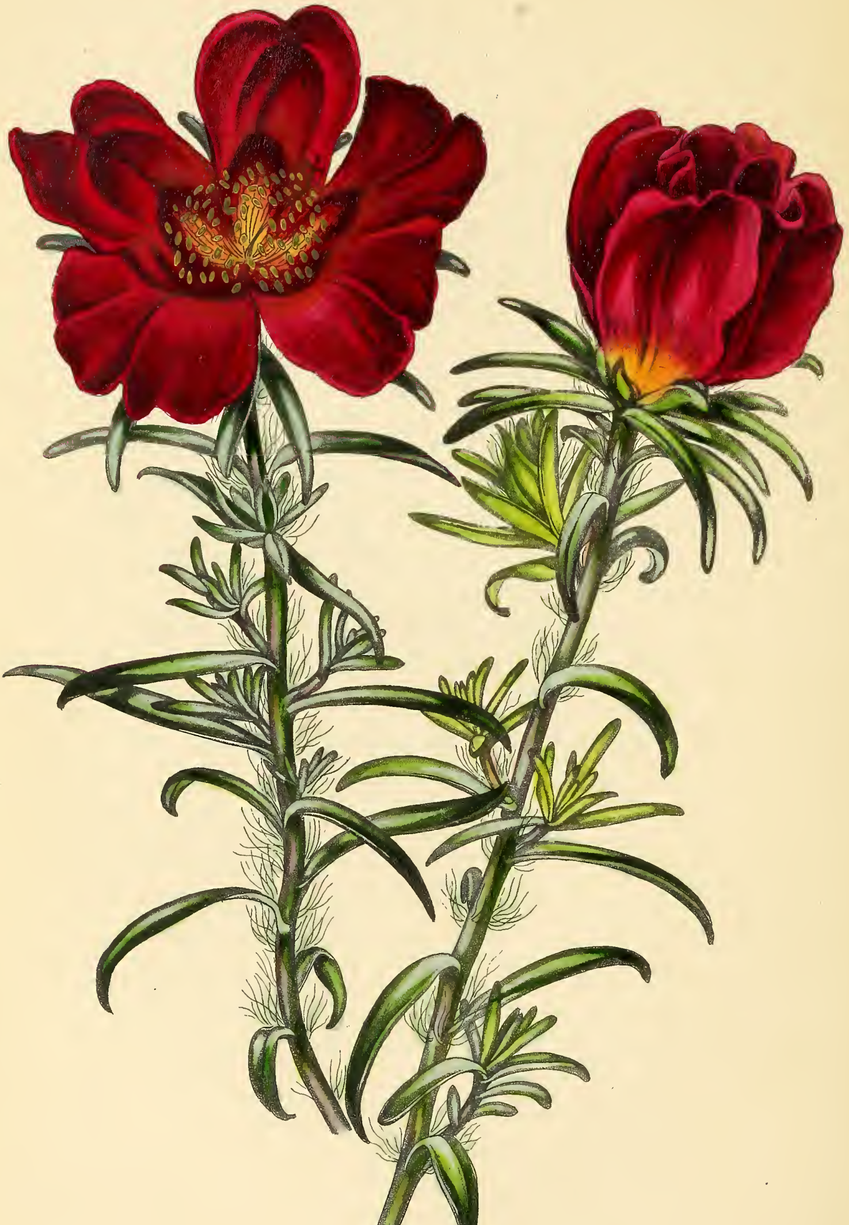
From its habit, and inflorescence, and the treatment it demands, it may yet be popularly classed with *Kennedya* for the purposes of cultivation. In common with the delightful species of that group, it is an elegant climber, of a not very rambling description, peculiarly fitted for growing in pots; and producing, like many of the *Kennedyas*, a gay profusion of lovely blue blossoms. It has, however, some peculiarities by which it may be easily recognised. Its stems are strong, smooth, and usually green; the leaves are scattered or distant, in threes, long, and somewhat reticulated; and the floral racemes are particularly large, lengthy, and composed of an astonishing number of flowers.

Still, what it gains in comparison with some *Kennedyas* from the abundance of its blossoms, is detracted from it on account of the rarity of their production, and the fact that young and small specimens seldom flower. From this circumstance, and from the remoteness of its leaves, it seems to us ill-fitted for planting out in a border, or training to the pillars or rafters of a greenhouse or conservatory; as it is admitted that plants whose roots are confined generally flower soonest, and it is also desirable that those fastened to the frame-work of an ornamental house should be well clothed with foliage.

The ordinary mixture of loam and heath-mould forms a suitable compost for this species and its allies. In accordance with the opinions above declared, we should prefer confining it to a pot, and training its branches pretty closely round a circular, square, or hexagonal trellis. In fact, we have observed that it always flowers more freely, and maintains the neatest and best appearance, when so treated. How far pruning or shortening the shoots would assist in facilitating the development of blooms, we are not prepared to state; but it would possibly be found beneficial.

This species is propagated by cuttings, which are most frequently taken off in the spring, and placed in pots, beneath a glass, in a house that is kept closed and shaded, though not supplied with artificial heat. It may likewise be increased, by the same means, in either summer or autumn, and both with or without fire-heat.

In the gardens of Sir Edmund Antrobus, Bart., at Cheam, Mr. Green cultivates *H. Comptoniana* with remarkable success; and from a handsome plant which bloomed there during last summer, the drawing now submitted was made. As it can be procured cheaply in almost all the nurseries where exotics are grown, it should be secured, in conjunction with the valuable species of *Kennedya*, for every greenhouse in Britain.



Portulaca Thellusonii.

PORTULÀCA THELLUSÒNII.

(MR. THELLUSON'S PURSLANE.)

CLASS.
DODECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
PORTULACÀCEÆ.

GENERIC CHARACTER.—*Calyx* either free, or adhering to the bottom of the ovary, bipartite, ultimately separated at the base, and deciduous. *Petals* four to six, equal, detached from each other, or united at the base, inserted on the calyx. *Stamens* eight to fifteen, or indefinite ; filaments free, sometimes adnate to the base of the corolla. *Ovary* nearly round. *Style* one ; five, six, or nine-cleft at the summit; or, style wanting, and stigmas three to eight, elongated. *Capsule* somewhat globular, one-celled, separated in the middle. *Seeds* many, affixed to the centre of the placentæ.

SPECIFIC CHARACTER.—*Plant* annual. *Stems* erect, succulent. *Leaves* alternate, somewhat cylindrical, acuminate, obtuse, with a number of filamentous stipules round their base, becoming nearly verticillate immediately beneath the flowers. *Flowers* on the summit of the branches, sometimes collected into small heads, sessile. *Corolla* large, expansive, deep red. *Petals* two-lobed, slightly concave.

THE accompanying figure of this exceedingly interesting and somewhat rare plant is now brought forward with the view of calling attention to its great merits. These consist mainly in a capacity for creating a most brilliant display for many months in the year, in a stove, a greenhouse, a frame, or the open border; for in either of these situations it perfects its splendid blossoms throughout the whole of the late summer and early autumnal months. Its habit, too, is particularly dwarf, its flowers very abundant and in rapid succession, and its cultivation extremely easy.

Seeds were sent from Florence to the Horticultural Society by the Hon. Frederick Thelluson, now Lord Rendlesham ; and in the garden of that body, at Chiswick, it first produced its flowers. These are of an intense reddish crimson hue, and are superior in colour and beauty to those of any other known species. At first, it was described as a variety of *P. grandiflora ;* but subsequent investigation induced Dr. Lindley to elevate it to the rank of a species. It ranges, however, near *P. grandiflora ;* but, says Dr. Lindley, " its deeply two-lobed petals form a good mark of distinction from that species; while its longer and taper-pointed leaves, annual habit, and more spreading petals, seem to separate it equally from *P. Gilliesii*."

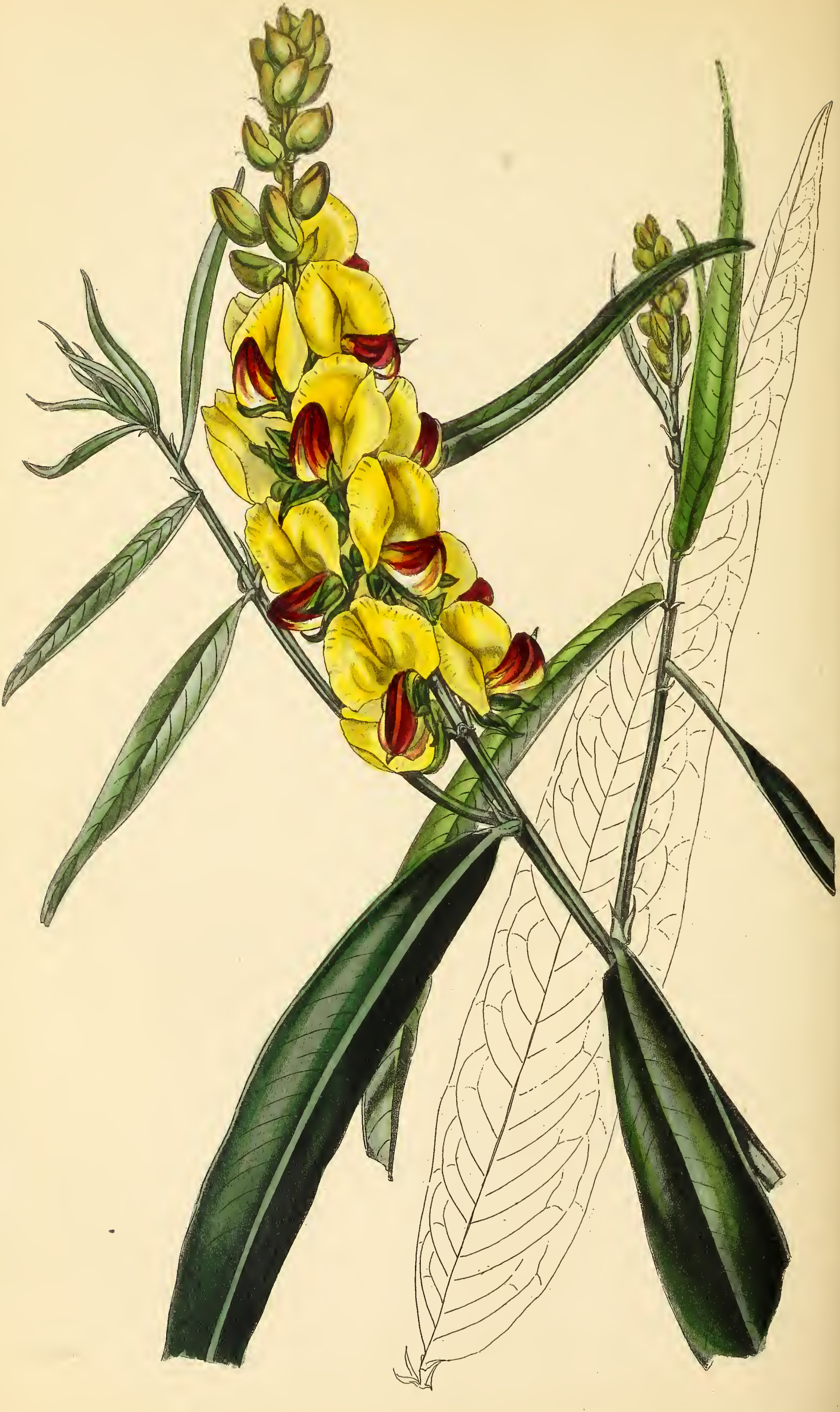
Treated as a half-hardy annual, the seeds may be sown in the beginning of March on a gentle hotbed, protected by common mats, or thick canvas thrown over a temporary wooden frame; or they can be sown in pots, and these plunged in fermenting material, in any hotbed frame that happens to be in use. When the young plants appear, they should be potted in small pots, and kept for a time in a mild heat, or a warm frame or greenhouse, and afterwards transferred to an open frame, which is covered at night in cold weather, till they are required for transplanting. About the middle of May they are to be transferred to the open ground; but a dry sheltered border or rockery, such as is usually assigned to Mesembryanthemums, must be prepared for them, and the soil should not be of a wet or retentive nature. They will thus bloom during sunshine (for the flowers do not expand except beneath the direct rays of the sun) for a lengthened period; and seldom cease flowering before the arrival of frost.

The greenhouse and stove culture may be precisely similar to the preceding; only, the seeds can be sown in February, and the plants must be repotted as they require it. Light sandy loam, with a little heath-mould, and a free admixture of sand, is a proper compost; and, if potting be attended to, the plants will often, by autumn, be nine inches or a foot in diameter, with from twenty to thirty principal branches, and a proportionate quantity of flowers. For placing on shelves, the dwarfness of this species renders it peculiarly appropriate; and the richness of its blossoms causes its introduction to plant-houses to be very desirable. Seeds should be saved from specimens in a cool greenhouse, or, when they are duly ripened, from those in the open air, and not from such as are kept in the stove.

Although strictly an annual species, it may be multiplied by cuttings, which will live, and sometimes flower, all the winter in a cool stove. Their blossoms do not, however, open perfectly in the winter season, for want of a greater amount of solar influence.

Its native locality is Mendoza, a province of South America, between Buenos Ayres and Chili. It has flowered, and been propagated extensively, at the nursery of Messrs. Rollisson, Tooting, to whom we owe permission to obtain the present figure, which was made in September last.

The genus is named from *porto*, to carry or bear, and *lac*, milk, in allusion to the juicy or succulent character of the species. *P. Thellusonii* commemorates the gentleman by whom it was introduced.



Callistachys longifolia

CALLISTÁCHYS LONGIFÒLIA.

(LONG-LEAVED CALLISTACHYS.)

CLASS.	ORDER.
DECANDRIA.	MONOGYNIA.

NATURAL ORDER.
LEGUMINOSÆ.

Generic Character.—*Calyx* bilabiate, very villous; upper lip bifid, lower one three-parted. *Vexillum* erect, longer than the keel and wings, which are about equal in length. *Stamens* inserted in the disk. *Style* incurved. *Stigma* simple, acute. *Legume* stipitate, woody, dehiscent at the apex; young ones many celled. *Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub, growing four or five feet in height. *Stems* very strong, roundish, covered with pubescence, branching freely. *Stipules* small, awl-shaped. *Leaves* sometimes six inches long, lanceolate, mucronate, reticularly veined, smooth above, downy beneath. *Flowers* in a terminal spike. *Segments of the calyx* ovate-lanceolate, densely covered with brownish hairs, persistent. *Vexillum* large, pale yellow. *Wings* reddish purple. *Keel* pinkish-white, tinged with purple.

Among the numerous species of plants raised by Mr. Low of Clapton, in the years 1839 and 1840, from seeds collected in the Swan River Colony by Mr. Drummond, the plant at present represented was one of the greatest promise; as it was expected, from the description received, to prove a new and valuable *Chorizema.* From the rapidity with which it grew, the strength and height of its stems, and the extraordinary length of its foliage, it became palpable; however, long before it flowered, that it had little connexion with *Chorizema;* and when the blossoms were unfolded, in the summer of last year, at Messrs. Rollisson's, Tooting, it was at once seen that it belonged to the genus *Callistachys.*

As the leaves, which are always particularly long, and sometimes more than seven inches in length, (of which, indeed, the outline behind our coloured figure is of the natural dimensions,) seem to us to afford an excellent distinctive feature, and as we are not aware that the species is described in any other British publication, we have thought the name *longifolia* strikingly applicable.

Like most of its allied species, it is a rather straggling plant; or, at least, grows to the height of five feet or more, and is not very suitable for small collections. In larger places, it forms a fine healthy-looking object, of which the leaves are the most conspicuous and beautiful features; while the large yellow and brown flowers are produced very liberally from the extremity of every shoot, and the specimen at Messrs. Rollisson's, before alluded to, has blossomed almost continuously from June last, to the present time. It should here be remarked that, perhaps on account of the extremely confined position of the plant in question, the flowers on the lateral shoots do not expand thoroughly.

Altogether, it is a rather ornamental species, and may either be planted out in the border of a conservatory, or kept in spacious pots. If allowed a place of the former kind where it has plenty of room to extend its branches, (which take, for the most part, a perpendicular direction,) it would no doubt make a handsome plant, and its flowers would most likely be duly perfected. It is now in a like situation, as far as respects the roots, at Messrs. Rollisson's, with the disadvantage of being in a low house, where its branches are necessarily obstructed by the roof, and require to be bent downwards.

In a pot, again, it will be found to flourish in fresh loam, mixed with a trifling, proportion of heath-soil and sand. If thus treated, it should not be too much restricted for pot-room; since one of its most interesting characteristics is its healthy and luxuriant aspect. Water, too, should be freely supplied in the summer season; and, as a stimulus to the full development of all its flowers, it should be placed where it can receive a more than ordinary amount of solar light.

By the preparation of cuttings in the usual manner, and their plantation in light loam, under a hand-glass, in a cool house, propagation may be effected to any extent in the spring months. Perhaps it will ultimately ripen seeds in our greenhouses; and these, from the short period which seedling-plants remain before they flower, may likewise prove useful in its multiplication.

The generic title is contrived from *kallos*, beauty, and *stachys*, a spike; the large terminal spikes of yellow flowers being very handsome.

HORTICULTURE AS A SCIENCE.

NO. II.

EARTHS AND SOILS.

In our first, or introductory article (No. 85, page 9), we endeavoured to show that gardening was an art of far higher pretensions than those persons can admit it to be, who look only to the routine of the mechanical operations which attend it. And also, by referring to the mighty agents which are constantly exerted in effecting the development and progress of every plant, from the humblest moss to the lofty fir-tree, we hoped to make it evident that it ought to be treated and studied as a *science*, which can never be duly appreciated till its principles be taught in seminaries, or in classes attached to Horticultural Societies, by men of talent and practical knowledge.

Earths and Soils being essential to the growth of plants, and, to a certain extent, familiarly known to every one, claim our first attention; though it must be confessed, that to attain a thorough understanding of their structure and components, would demand a profundity of chemical knowledge which few can hope to acquire. We avow our intention not to perplex the student by attempting to enter into the mysteries of science; and, therefore, we restrict ourselves to point out what ought to be, and may be known, leaving it to time and superior ability to effect that great object which we hold up to view.

The very term of *earth* involves a tissue of errors and misconceptions, which are the sources of half the failures that professional men, in common with amateurs, are subjected to. *Loam* is a word in the mouth of every one; we meet with it in every horticultural page: yet who understands it? Agricultural chemists have felt the importance of the difficulty, and have written and lectured to a very great extent on the subject of *analysis of soils;* yet how little have their labours been appreciated!

By this term *analysis*, derived from the Greek verb *analuo*, we understand the dissolution, disseverment, or entire separation of parts, under powerful chemical agency; and, therefore, we perceive at once a difficulty, which they who are not versed in the processes of the laboratory can by no means surmount. Yet we hesitate not to affirm that earths and soils can never be completely understood without the assistance of analytic chemistry, and, therefore, claim the admission that this branch of science ought to become a part of horticultural education. So far we have gained a point; for if it be true that a soil, in order to be properly applied to a plant, should be thoroughly known; and, moreover, if it cannot be so known till it be subjected to chemical agency, then the science of analysis should be taught to the youth of the rising generation whose aim it may be to keep pace with the intelligence of the age.

But though we claim this admission, we are conscious that, in the existing state of knowledge, we should only embarrass and discourage by an attempt to elucidate the direct processes of analysis; and, therefore, propose to adopt a more simple order of investigation, by which we hope to remove many difficulties, and to instruct any one to acquire some degree of certainty and precision in estimating the structure (if the term be admitted) of an earth, and its applicability to the operations of horticulture.

At an early period after the formation of the English Agricultural Society, now "*The Royal Society of Agriculture*," a prize essay on soils was written by the Rev. Mr. Rham, which was printed in No. I. of the Society's Journal. This gentleman perceiving the difficulties attendant upon a regular analysis, by chemical agents, devised and propounded a mechanical process, which possesses high merit, and has our cordial approval. It has already been honourably noticed in more than one periodical of wide circulation; but, able as it is, we find the processes too elaborate for ordinary practice; and after all, the reverend gentleman has been constrained to introduce one or more chemical agents into his routine.

The three chief earths, which will be found in almost every good garden, are loam, heath or moor-earth, (erroneously called peat,) and leaf-mould. *Sand* of every kind is in constant requisition, but by it we understand the silver, or Calais white sand, which needs no investigation, being, when pure, little else than flint in a state of minute division, and therefore unsusceptible of decomposition.

Loam is the staple of the land; it occurs abundantly, but varies extremely in its texture and quality. That species which is propitious to every operation of the garden and floriculture is soft and velvety, fat or unctuous, but so little liable to adhere or clod, that if a handful of it be compressed tightly, when just so moist as to be in a fit condition for the use of potting, and be suffered to fall from the hand, it will break on the ground, and separate into fine particles. Such a loam will remain firm, yet open, in a garden pot, without cracking into fissures or detaching itself from the sides. It is composed of pure clay, very fine sand, iron in a condition resembling ochre, and generally a small proportion of chalk. In naming *pure clay* (alumina), we do not mean *clay* in the common sense of the word, because the stiffest and most binding clays of the field contain a very large portion of sand. But to prove the existence of the above-named earths, it is necessary to have recourse to chemistry; and as it is not our present object so to do, we must restrict our investigation to texture only; therefore, whenever it is intended to compare two kinds of loam, the gardener should possess himself of a sort which he knows to be good, approaching in quality to that we have above described, and by submitting it to the following simple operations two or three successive times, in order to prevent error in early practice, a *standard* will be obtained by which to judge of the value and applicability of any loam that is found elsewhere. The *instruments* of analysis might consist of a pair of scales, sufficiently accurate to discover a single grain, a set of troy weights, three or four jugs or tall narrow glasses with lips, a tin drainer with fine holes, a small hair-sieve, another of gauze, a glass or earthenware funnel, a few folded pieces of white blotting-paper to make filters, a small pestle and mortar of wedgewood ware with a lip, and a tumbler glass or two. These will form a very ample set of utensils; the scales, mortar, two small jugs, and a few cups, would even be sufficient, as we have frequently proved.

Process:—Collect a specimen of the loam to be examined, dry it in the sun, and take away any stones and pieces of wood that may be among it. Then weigh an ounce or half an ounce, troy or apothecaries' weight,—*i. e.* 480 or 240 grains. Rub the earth in the mortar so as to detach the gritty sand, and separate *that* by a sieve. Weigh the grit, and note the weight in grains: again weigh the fine siftings accurately, and make up any loss by a little more fine earth: then dry it in a saucer at a heat greater than that of boiling water. Weigh it while hot, and the loss will show the quantity of moisture which the soil retains naturally, however dry it may appear. This moisture it will attract again by being exposed to the atmosphere.

Return the fine earth to the mortar, and rub it with water, gradually added, till a separation of parts be apparent; then pour off the floating matter, and repeat the rubbing and washing with fresh water, till nothing but sand remain in the mortar: dry this sand by placing the mortar on the stock of a grate, or a warm iron plate. In the mean time all the waters being collected together in one jug or glass, will gradually deposit the fine particles, and the liquor will exhibit more or less colour, resulting from vegetable, or other manuring substances, contained in the earth.

This earth and water should next be thoroughly stirred, and after standing quiet for two or three seconds, be poured into another vessel, slowly and cautiously, because some sand will have passed from the mortar which ought to be separated; and this must be done by repeated washings and decantings.

This second process will separate the fine matter of the soil, and the sediment can readily be collected by pouring off the water that appears quite clear, and then the remainder with the sediment, either into a plate or a paper filter previously weighed and placed in a funnel. In either case, the few particles remaining in the jug must be removed by a little more water, and added to the rest, or be wiped off by a piece of dry linen accurately weighed beforehand. The earthy sediment is to be dried first by slow evaporation, and then by a greater heat, equal to that which was employed in the first instance. All the dried products are to be weighed, and when three experiments of the kind have been completed, the operator may arrive at something like a correct conclusion.

Thus, of 240 grains, there may be 120 of the *fine earths* which we call clay, as they contain all the alumina of the soil; of *coarse sand*, separated by sifting, twenty grains; and of *fine sand*, left by the several washings, ninety. But there must be some loss, and ten grains is not much in 240.

It is evident that we do not detect the chalk, iron, or pure clay, by this investigation; nor can we hope to do so without chemical agency; but we have discovered how to compare one soil with another, and now can form some notion of the errors and failures which attend a vague and random use of terms, and shall no longer take it for granted that the loam of a Middlesex nursery is identical with one so called in Yorkshire.

But there is also *vegetable nutritive matter* in all loams, and a portion of this is soluble in water: the actual weight of it may be ascertained with comparative accuracy by taking a fourth parcel of the dried, powdered loam, and keeping it at a full red heat till there remain no black colour in the earth after becoming cold; the loss of weight will then determine the quantity of vegetable fibre, or of the substance now called *humus*, which the loam contained; and thus its fertilizing qualities will be more readily estimated. It is astonishing to what extent sand may exist in a loam, and yet leave it hard bound after watering; a sharp, harsh, gravelly grit may form three parts of four of a loam that then remains quite intractable; therefore, we advise the gardener to attend strictly to the texture of the sand, which, in the best loams we have ever seen, is finer than silver sand:—upon this ingredient depends the softness of the loam, and its fitness for the purposes of pot culture. If equal parts of this fine earth and heath-soil be required for a certain tribe of plants, a gardener who has a stiff and rigid loam only at command, must employ but one third of it, and even less than that, otherwise he must fail in keeping his plants in health.

Of *leaf-mould* and manure, we must speak in an another article. *Sand*—pure sand—requires no analysis; but pit-sand should be washed. *Heath soils* differ exceedingly, yet all contain iron. They only require the operation of fire to ascertain their relative value. Each specimen should be dried, weighed, and burned in a Hessian crucible, or small iron ladle, till nothing but sand remain; and then the loss of weight will show the quantity of vegetable matter that each contained.

COMPARATIVE COLDNESS OF LOW AND ELEVATED LOCALITIES.

It appears perfectly plausible to suppose that hilly situations, exposed to all the violence of the bleakest winds, should be considerably colder than sheltered valleys, or level districts; and, as far as the human feelings are concerned, the assumption is mainly correct. But those who have observed the phenomena of nature, and not allowed any fact to pass unnoticed, or without seeking some satisfactory explication, well know that vegetation is affected very differently to man under certain conditions of temperature, and that frost, which is generally most fatal to plants, is far more prevalent in valleys than on hills.

This statement is by no means novel. It has long since been ascertained that the coldest air has the greatest specific gravity, and must necessarily, by its own force, accumulate in the lowest localities. Moisture, too, being more abundant in valleys, as well in the soil as by the constant exhalations of the streams that usually flow through them, increases both the density and the coldness of the atmosphere, and renders the occurrence of frost more likely.

Several striking proofs of this position were presented to our observation during the last season. It will be remembered that in the month of September a frost occurred which, in most places near London, destroyed the Dahlias then in flower. Those gardens, especially, which lie in the vicinity of the Thames, had all their tender ornaments killed. We noticed at Chiswick some fine collections of Dahlias most completely mutilated. At Ealing Park, however, the seat of Mrs. Lawrence, which is situated on a much higher level, none of the Dahlias appeared to be injured. Those at Chatsworth, again, growing in a valley watered by a moderate sized river, were greatly damaged, and their flowers entirely cut off for the season; while, on the exposed moors near Sheffield, where the cold seemed much more intense on account of the keen winds which prevail, we saw Dahlias and Roses blooming for nearly a month afterwards in uninterrupted vigour.

We bring forward these simple cases, not, as already hinted, to support a new principle, but to establish and add force to one which is far from being properly considered. It has been clearly shown that an exotic plant which, perhaps, is as susceptible of injury as any other at present cultivated, and is, therefore, an excellent test of the temperature of any locality, suffers much more and sooner in a comparatively protected vale than at a greater altitude which is utterly unsheltered. The notion of placing plants in a low spot, to provide them with a natural screen from the wintry winds, must, consequently, be altogether abandoned.

To the person anxious to acclimatize exotic plants, whether he be choosing a fresh residence, or selecting a spot in his domain suitable for the purpose, we recommend reflection on the foregoing remarks. Yearly experience attests, that while specimens planted on the sloping surface of hills sustain unharmed almost any degree of frost, those assigned to a low level are ever more or less frozen. It should be recollected that the majority of the plants which we strive to naturalize are from the *elevated parts* of tropical or warm countries, and are very rarely, or in only a few instances, found in the plains of more temperate regions. Such a consideration is peculiarly instructive.

In the first place, it impresses us with the fact that they are mostly beyond the reach of the moisture evaporated from large bodies of water. Secondly, it proves that the soil in which they grow is *not very deep*, and particularly *well drained*. And, lastly, it demonstrates that, from their position, the action of the sun and wind must perpetually preserve them from too rank a luxuriance, and effectually ripen their newly developed wood.

The beautiful Himalayan and Mexican species of Pinus, and other trees and shrubs from the same or similar districts, will never, we are satisfied, have their hardihood fairly determined, until they are placed above the immediate influence of rivers or lakes, and on a slope that in some measure approximates to their native hills. We are familiar with gardens in which both this and a contrary course have been adopted, and some, also, wherein only a fertile glen or level is employed. The results, as far as they have yet been manifested, uniformly confirm our previous declarations.

Lest it should be imagined that the effect on vegetation of a difference of temperature between hills and valleys is solely absolute, or arising entirely from the intense coldness of the atmosphere, we shall rectify any such partial view. From the greater humidity of the air and soil, and the diminished agency of sun and wind, plants in low places are always more charged with moisture, and their growth is more exuberant and less mature, than those which inhabit hilly tracts. Hence, in addition to the increased amount of frost to which they are liable, they possess within themselves the means of rendering it more destructive. We would now expressly caution every cultivator against planting tender species either in valleys or very expansive plains, and press upon them the importance of choosing an open inclined surface for naturalizing exotic plants.

DWARF EVERGREENS FIT FOR PLANTING ON LAWNS.

Few gardens are destitute of that most delightful feature of the pleasure grounds, a glade of turf: now spreading uninterruptedly in its pleasing verdure, and swelling into varied undulations, or assuming a level sweeping aspect; and anon profusely dotted with isolated shrubby, or arboreous ornaments, or diversified clumps and plots. If tastefully disposed, the trees or groups scattered over it will form occasional shady recesses and retired nooks, through which the glow of a summer's sun and the rigour of the wintry blast will alike find it difficult thoroughly to penetrate.

There will be other spots, again, which are secluded from cutting winds by their depressed position, and the protection of surrounding trees, but which present a more ample superficies, and admit a much greater glare of light, the influence of which last is modified by the vicinage of the highest forms of vegetation, and the partial concavity of the surface.

Still further, shrubbery walks, bounded by broader or narrower masses of turf, will be carried round the whole, or across some of its less interesting portions; and in these grassy outlines, occasional breaks or expansions will occur, both to alleviate the monotony of long, confined walks, and allow the introduction of handsome flowering shrubs.

All these situations afford the precise kind of shelter and shade requisite for the sort of shrubs we are about to notice, and which consist of low evergreens that do not all positively demand such conditions, but, for the most part, thrive best when they are secured. The plants we refer to are the better varieties of dwarf *Rhodo-*

dendron, *Kalmia latifolia* and *hirsuta*, nearly all the hardy Heaths, many of the species of *Andromeda* and *Vaccinium*, *Gaultheria shallon*, and even *Daphne laureola*, with several others that are related in habit.

None can conceive but those who have witnessed, the astonishing difference in the effect of a specimen of any of these kinds when planted in an ordinary border, and when placed solitarily on a lawn. Independently of their greater vigour in the latter case, resulting from the more constant moisture preserved about their roots in summer, their outline is wonderfully improved; their lower branches either become prostrate, or so dense as to conceal the stems; there are fewer interruptions, from decayed or imperfectly formed shoots, to the continuity of their surface; they are far more symmetrical; the observer may walk round them and discover equal beauty on all sides; and their appearance at all times, but particularly while they are flowering, is considerably more interesting from having a light green ground about and beneath them.

So repeatedly has our attention been arrested by objects of this description in various parts of England, that the mention of individual instances will perhaps be deemed unwarrantable. We have nevertheless the best motives for pointing out the beautiful Heaths, Rhododendrons, &c., in what is called the Rock Garden at Blenheim; similar plants at Nuneham, in Oxfordshire; and fine specimens of *Kalmia latifolia* and its allies in Lady Tankerville's villa, Walton-on-Thames, and of *Gaultheria shallon*, at Mrs. Marryatt's, Wimbledon.

The popular belief is that Rhododendrons, Heaths, and those plants on which the epithet "American" is commonly bestowed, will not flourish in anything but moor or heath soil. Nothing could be more at variance with the truth. The extensive experiments unconsciously made on almost every large estate throughout the country—than which no criterion could be less fallible—prove the direct converse of that impression. It has, however, been most freely diffused; and as simple contradiction will never suffice to remove it, we would urge all to try it for themselves.

Soil alone has been shown to be of very little importance in the out-door cultivation of these plants. Any sort of loam, and even a stiff clayey earth, has, in some localities, proved the most appropriate. Whereas, when planted in the soil obtained from moors, Rhododendrons can rarely be kept alive through the summer months without copious artificial waterings, and they never attain that beauty which is common to them in a more retentive earth.

A point of much greater moment than the above, is their position with respect to the distant umbrage and protection of tall plantations. It may be said that the tribe on which we are now writing will grow freely in exposed situations; but with just as great propriety might it be averred that succulents will flourish in a shaded house. We do not, either here or on any occasion, recommend a system of treatment by which an inferior degree of attraction may be gained. Our design is to explain how things may be brought to the highest perfection. And with this end in view, we possess a preference for at least a partially sheltered and secluded spot. Either or all of the positions indicated in the commencement of this paper, may be advantageously chosen.

In planting out small specimens of Heaths, Rhododendrons, or their congeners, it is not to be assumed that they will at once establish themselves in a common garden earth, if it happen to be of a loamy or clayey nature. All plants are more easily injured while in a young state than they are after having reached a certain age; and will also often succeed well in some soils at the former period, which they would not grow vigorously in during their subsequent progress. This may be readily accounted for. If young specimens of some species be placed in a wet and nutritive soil, they will advance too rapidly to have their shoots matured, and thus become liable to injury from cold. It is so with the class at present before us; which should have a small pit, about two feet in diameter, and half that depth, excavated where they are intended to be planted, and the space filled with a prepared earth, of which heath soil and sand should constitute rather more than half. A twofold benefit will be derived from such an arrangement; for not only will danger be guarded against, but the plants will grow slowly at first, and be more likely to form symmetrical compact bushes.

By providing a proper compost for the plants at the time of transplantation, further attention of that kind will be dispensed with; as the roots will gradually strike into the natural soil, and soon become accustomed to the additional supply of nutriment and fluid it contains. If the surrounding land be notoriously bad, liable to saturation, and ill adapted for all sorts of plants, a much greater excavation and introduction of compost must be made; but in no other case will it be necessary or desirable. The general opinion that all Heaths need a large proportion of moor soil, has very slight foundation in fact; and, for the hardy ones, it is still less indispensable.

After planting out the specimens, turf should be laid beneath them, close around the stems, and the shoots may be encouraged to spread themselves horizontally; since nothing can be more beautiful than the branches of a plant, laden with blossoms, lying prostrate on a nicely mown lawn, and so blending with it as to form, as it were, a part of the turf itself. A few of the Andromedas, and *Gaultheria shallon*, will bear to be slightly pruned in order to keep them dwarf and dense. The Heaths and Rhododendrons cannot be safely interfered with.

With a judicious selection of Heaths, which bloom through the autumnal and winter seasons, of Rhododendrons, Kalmias, and Lyonias, which flower most liberally in spring, and Andromedas and *Gaultheria shallon*, which blossom all the summer, the gaiety of a garden may be very greatly enhanced. But what renders these species most valuable, is the contrast their deep green verdure presents to the dull, dingy green of a lawn during winter, and especially the brilliant flowers of the Heaths at the same period, and those of other kinds in the spring. For the sake of variety, the common Savin (*Juniperus Sabina*) is an exceedingly interesting plant for a lawn, and some large masses of it at Chatsworth look remarkably well in the winter season.

REMARKS ON ARBORETUMS.

It is the universal testimony of those who have bestowed any thought on the workings and tendencies of the human mind, that the adoption of any extreme course of conduct always eventually leads to an attachment to the opposite extreme. And this has been frequently verified in the annals of horticulture.

Many classes of plants and modes of culture, which hold, for a time, a widely spread sway over the votaries of the pursuit, almost invariably give way to a tribe or a system as different as possible from those before admired; while certain flowers which happen to be extremely fashionable at one period are scarcely to be met with in the majority of places a few years afterwards; whereas, perhaps, the lapse of a similar number of years may find them again installed in public favour.

As a signal exemplification of the above principle, we have to advert to the recent history of exotic trees and shrubs. Without going farther back than the beginning of the present century, we shall perceive that in very few collections the really worthless or the more truly ornamental of the rarer kinds were allowed a place. Common or second-rate gardens were generally decorated with masses of shrubbery, composed of ordinary species and varieties, and specimens of the finer sorts were seldom observable. Within the last fifteen or twenty years, a singular reaction has taken place. Instead of mixed groups, and solitary specimens, brought together or detached without any regard to their botanical relations, and solely with reference to their picturesque effect when viewed in connexion with each other; it has become the fashion to collect *all* the known species of particular genera, or of every genus containing hardy ligneous plants, and to plant them in beds or masses, over a greater or less extent of surface, according to their systematical affinity. Such collections now bear the name of Arboretums.

The example of planting Arboretums having been set by several influential individuals and societies, and a strong inclination being manifested by others to follow out the same plan, it is important to show that what is in some cases laudable and desirable, may not be fit for general adoption, and, in fact, becomes absolutely disgusting when too often or improperly repeated. We will first examine the object of Arboretums, and see how far it is compatible with the great ends of landscape gardening.

To present, in an aggregated form, a view of all the trees and shrubs that can be cultivated in British gardens, so that their peculiar or relative natural beauties or singularities may be at once discovered; to afford the means of investigating the affinities and value of all classes of arboreous plants; in short, to establish a large experimental ground for determining the distinctness or identity, the tenderness or hardihood, the handsomeness or insignificance, of the woody tribes of vegetation, and at the same time ensure as interesting a disposition and display as can be obtained, are what we conceive to be the purport of an Arboretum. That it is advisable and useful to familiarize the public with every variety of tree, and to ascertain decidedly its true character, will at once be admitted. Consequently, a national or suburban Arboretum must be extremely serviceable in many respects. How far the recreation furnished by such an establishment, or its influence on the minds and morals of visitors, falls short of what would be caused by a greater diversity of objects and arrangement, will be immediately obvious.

To create an Arboretum in a private garden, far other circumstances must be taken into account; and unless it be made quite a subordinate feature, and carried round the extreme outside of the pleasure-grounds, it will inevitably prove a palpable infringement on taste. To render it at all pleasing, it must be formed on a piece of ground of which the surface is exceedingly irregular, the direction considerably varied, the sides composed of old plantations of trees, advancing and receding in the greatest apparent disorder, and only one principal walk, having numerous and occasionally abrupt turns and windings passing through the centre. If possible, all prepared hillocks and artificial plots should be avoided, and the spaces between and beneath the trees be sown with grass, which might be mown about once in three weeks. Every large tree that can be left standing with propriety, every practicable deviation from order and system, and every opening that admits a view of the distant park or country, are to be assiduously sought, in order to relieve the necessary wearisomeness of artificial classification. And if a small stream can by any means be conducted through the department, or any portion of it, a lively alleviation of the prevailing sameness will be obtained.

All attempts at forming an Arboretum in a garden of limited extent, or flat surface, are sure to result in a displeasing and almost unbearable dulness, if a botanical arrangement is followed. It is only when the natural character of a plot is in itself beautiful, when every available assistance from art is employed, and the other divisions of the pleasure-grounds are immeasurably more extensive, that an Arboretum is at all tolerable.

One of the chief principles of landscape gardening, and one likewise which, being founded on a peculiarity of the mental constitution, is as lasting and immutable as the feeling on which it is based, is that the scene which, in the smallest compass, exhibits the most diversified aspect, conformable with congruity, is the most creditable to its designer, and productive of the largest amount of pleasure. Any arrangement, therefore, that associates plants in a landscape solely on account of their generic alliance, and not because they are found by proximity mutually to augment each other's beauty; or which introduces a quantity of species that have neither interest nor ornament to recommend them to notice, must, if wanting stronger arguments in its support, be decidedly repudiated.

The objectionable nature of Arboretums, except in places where there are unusual facilities for making them pleasing, have been before freely stated. We recur to the question here as it involves a standing principle, the violation of which, in any egregious manner, will entail a durable disgrace on the horticulturists of the age.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR FEBRUARY.

Ismène virèscens. A small and rather uninteresting species, with greenish-white flowers, which have, however, an agreeable odour. It was found by Mr. Pentland, near Cusco in Peru, and from thence imported by the Horticultural Society. Being a greenhouse bulb, it should have an abundance of water from the commencement of April till it ceases flowering in the end of August, after which absolute drought is essential. Mr. Herbert suggests that the species of this genus may be readily grown in a sheltered border in the summer, by planting them in nearly pure sand; removing the bulbs into a box of dry earth in the autumn, and protecting them during winter. The seeds vegetate with remarkable rapidity; and this mode of propagation may be advantageously employed. *Bot. Reg.* 12.

Mùsa supèrba. Seeds of this species were received from the southern part of India at the Edinburgh Botanic Garden, and after having been sown fourteen months, the plants they produced began to bear flowers. It seems to grow about five feet in height, with a very short stem, and leaves of the ordinary large half-drooping form, with prominent nerves. "The flower-bud," says Dr. Graham, "as I have proved by cutting down full-grown plants of *M. rosacea* and *Cavendishii*, and I think also of *M. paradisiaca*, remains at the root till a time after the plant has attained its full size, varying according to its treatment, and then pushes its way upwards—its appearance at the top of the stem being preceded by the evolution of one or more leaves smaller than the rest." The flower-spike is long and drooping, the bracts large, of a purple or reddish brown colour within, and the flowers, like those of the other species, partially concealed. The fruit, it is stated, is not edible. *Bot. Mag.* 3849.

Œnothèra fruticòsa; *var.* ìndica. The common form of this showy species is a native of North America, but the present variety has been raised in the garden of the Horticultural Society, from seeds collected in Cashmere, and other parts of India. It is a hardy perennial, with stems eighteen inches high, dull-looking hairy leaves, and exceedingly ornamental bright-yellow flowers. Its flowering season is from June to August, and it flourishes in any garden soil, being easily multiplied by division in spring or autumn. From its compactness, its comparative dwarfness, and the rich colour of its numerous flowers, it well deserves cultivation. *Bot. Reg.* 11.

Oncìdium Wrayæ. One of the pseudo-bulbous class of the genus, with short, ovate, furrowed bulbs, which produce two small narrow leaves on their summit, though there are likewise two other smaller ones near the base in the younger stage of growth. The flower-scape is from three to five feet high, apparently almost erect, slender, branched, and bearing an abundance of brilliant yellow flowers; the sepals and petals of which are blotched with brown. The lip is large, slightly waved, of three rounded lobes, and deep yellow. Having been imported from Mexico by Mrs. Wray, of Cheltenham, it has been named in honour of that lady, who is "one of the most intelligent and enthusiastic of cultivators." *Bot. Mag.* 3854.

Solànum macranthèrum. The extensive genus *Solanum* does not contain a handsomer plant than that now noticed. It is described as being "nearly allied to the Bitter-sweet of our hedges, but its flowers are very much larger and handsomer." Mr. Page, nurseryman, of Southampton, received the seeds from Mr. Parkinson, of Mexico, in July 1838; and although some of those germinated were lost by moisture, a plant flowered last year. In Mexico, it has a climbing habitude; but the specimen above mentioned is only about three feet high, promising to be arborescent, and having large ovately-cordate downy leaves, with fine terminal panicles of reddish-purple flowers, conspicuous in the centre of which are the great yellow anthers. It is treated as a conservatory plant, and will probably thrive against an open wall as well as *S. crispum.* *Bot. Reg.* 7.

Sowerbæa laxiflòra. This pretty product of the Swan River Colony bears some resemblance to *S. juncea*, from which it differs in having "paler and smaller flowers, the stalks of which are long and slender, and in the leaves being nearly as long as the scapes, and triangular, not tapering." It is not unlike an *Allium* in appearance, having narrow leaves, which are considerably elongated, and large umbels of neat pink flowers, with yellow stamens in the middle. It is a greenhouse herbaceous perennial, with roots not at all bulbous, and easily cultivated in the usual manner. *Bot. Reg.* 9.

NEW, RARE, OR INTERESTING PLANTS THAT HAVE RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES.

Acàcia biflòra. A beautiful little species with somewhat oblique or one-sided leaves and showy globular flowers, which are of a deep yellow colour, and agreeably fragrant. It appears to have been introduced in the early part of the present century, but has probably been lost. From seeds imported by Mr. Low, of Clapton, from the Swan River settlement, it has lately been raised, and flowered profusely through the months of December and January. Several blossoms are yet expanded.

Acàcia platýptera. Another interesting addition to the genus, procured by the same gentleman from a similar source, and flowered in his nursery last November as well as at a more recent period. The name is aptly expressive of the very broad wing-like expansions on each side of the stems and branches; these in its existing state answering the purpose of leaves, and being in fact substitutes. The flowers are large, round, orange-yellow, and handsome; and when specimens of a greater size are obtained, the species will most likely bear a great profusion of them. In conjunction with the one above noticed, it is a useful ornament of the greenhouse during the dull season.

BORÒNIA ANEMONÆFÒLIA. Obtained from New Holland many years ago by Messrs. Loddiges, but never, as we are informed, before blossomed in this country. Its delicate pink flowers, which are not much unlike those of *B. pinnata*, are just beginning to expand in one of Messrs Loddiges' greenhouses, and are both pretty and abundant. Its distinction mainly rests on the character of the foliage, which has deep and numerous lobes, and as appears from its name has been compared to that of the *Anemone*, though the resemblance is not particularly striking.

BORÒNIA LEDIFÒLIA. Seeds of this species were procured at the same time as those of the preceding kind, and germinated in the same establishment. It may be considered much prettier than the other ; but this opinion is possibly due to the greater forwardness of its flowers, or the circumstance of the majority unfolding themselves almost simultaneously. The leaves are narrow, short, undivided, and rather scattered, while the blossoms are large, bright pink, like those of *Bauera rubioides*, with rounder petals than the foregoing species, and altogether a superior display of flowers. It is an exceedingly neat and ornamental plant, and will be valued by the growers of greenhouse exotics.

CŒLÓGYNE FLÁCCIDA. This is an extremely beautiful Nepal species, imported by Messrs. Loddiges a few years since, and at present blooming in their Orchidaceous-house. The pseudo-bulbs are long and thin, with two peculiarly lengthy, narrow, acuminate leaves issuing from their summits, and large pendulous racemes of flowers proceeding from their base. These racemes are particularly numerous, and bear a large number of lovely white blossoms. The sepals and petals are slender, the latter being a little narrower, and the lip has an elongated middle lobe, which curves under at the extremity. It is of a white ground, but stained with orange and striped with pink in the middle. The extreme profusion of the flowers renders this species highly valuable to the cultivator.

CYRTOCHÌLUM MACULÀTUM, *vars.* Scarcely two of this species can be found in which the flowers are precisely alike. Messrs. Loddiges have recently flowered a very large and superior variety, which in addition to the size of its blossoms has them of darker and richer colours. They have likewise bloomed an inferior sort, the flowers of which are not more than two-thirds the size of the one above mentioned, and of a duller coloured ground with paler blotches. A variety was lately figured in the Botanical Magazine under the title of *C. M. var. exornatum*, which seems destitute of the little horn-like processes at the end of the plates in the centre of the lip; but we doubt whether this peculiarity will prove durable, having seen individual flowers in specimens of the original species which distinctly wanted that appendage. At Messrs. Lee's of the Hammersmith nursery, a showy variety is now developing its blossoms. Its characteristics are rather broader sepals and petals, a rounder general outline to the flowers, and the presence of two or three irregular blotches on the lip.

Dáphne japónica. One of the attractive Japanese plants for which Europeans are indebted to the exertions of Dr. Van Siebold. It was brought by that gentleman to different places on the Continent, and from thence sent to Messrs. Young, of Epsom, with whom it is blossoming at the present time in the greenhouse. The leaves exhibit no remarkable features except a narrow yellowish band all round the margin, and the flowers are pale-pink inside with a purplish tinge on the exterior. The circumstance which renders the species most interesting is the delicious odour of the blossoms. This resembles the sweetest citron, and is something like that resident in the leaves of *Aloysia citriodora*, but decidedly more grateful. It is said to be hardy, or nearly so; but specimens will always be kept in the greenhouse on account of their exquisite fragrance.

Dendròbium —? A fine new species of *Dendrobium* has just flowered with Messrs. Loddiges, the general aspect of which, however, excels the appearance of the blossoms. It has strong, tall, round, yellow stems, which are stouter at the bottom, very thick oblong leaves unequal at the point, and long upright racemes of flowers, which are protruded near the top of the stem, but are not exactly terminal. The sepals and petals are much curled, of a dingy-purplish brown, with yellow margins. The lip is likewise curled, yellowish, and streaked with brown and lilac. It is believed to have been imported from Java, and is a very well-defined though not a strikingly ornamental species.

Dendròbium calamifòrme. The stems of this singular little species assume quite an irregular or zigzag form, and have more the appearance of pieces of dead sticks than of portions of a living plant. From the newest part of them, however, a very pretty, long, cylindrical green leaf is developed, which tapers gradually to a point. At the base of the leaf, on the top of the stem, an erect raceme of charming flowers is produced. These are in an inverted position, like those of *D. alpestre*, *D. teretifolium*, and some others; and their sepals and petals are small, white, and tinged with purple near the base. The lip is delicately attenuated and fringed, white, stained with purple. It is a native of New Holland, and has bloomed beautifully with Messrs. Loddiges for the past two months, being kept in a succulent house with a temperature a trifle lower than that of the stove.

Dendròbium elongàtum. Another New Holland species, but differing essentially from *D. calamiforme*. It has upright stems about one third of an inch in diameter, long, smooth, few-jointed, covered with white sheaths, and bearing a few leaves which are notched and unequal at the extremity, near the summit. From the apex of the stems a drooping raceme is protruded, this being considerably elongated and having many flowers, somewhat densely arranged. The blossoms are small, yellowish, spotted and blotched with brownish purple on the outside, and not expanding very perfectly. The sepals and petals are unusually thick. Like *D. calamiforme*, it will thrive in a house of only moderate temperature, and both succeed best when fastened to a log of wood, and suspended from the roof.

OPERATIONS FOR MARCH.

On the provision made during the present month for ensuring a good display of flowers in almost every department for the ensuing season, more depends than might at a mere glance be generally obvious. We shall trace rapidly and comprehensively the work to be done in the different divisions of floriculture.

Stove and orchidaceous plants will now, if they have been properly tended, be just commencing their yearly growth. They must, therefore, be immediately potted. Two very opposite principles should be observed in effecting this. Orchidaceæ, which have tender brittle roots, usually adhering to the receptacle in which they are placed, ought never to be shifted more than once a year, as their most valuable portions may be easily injured while growing. Ordinary stove plants, on the other hand, producing numberless fibrous roots, which are rather benefited by nearness to the outside of the pot, should be often and very gradually shifted.

For orchidaceæ, a pot or basket must at once be furnished which will admit of their completing the annual development; and to prevent any injury accruing from stagnant water, it is advisable to use wooden baskets, made of small billets, and open at the sides and bottom in every case where soil is not indispensable to the plant; and to employ turfy heath-mould or sphagnum moss instead of the close earthy peat frequently used. One point, however, must not be neglected. There is a considerable portion of the tribe which does not begin to grow at the present time; and the only circumstance which can justify repotting, is a decided indication of growth.

Stove woody and herbaceous species, must, like the Orchidaceæ, never be potted till they show signs of advancement. A few exceptions may be made in the case of tuberous-rooted or bulbous perennials, which may be potted immediately before the period at which they usually form shoots; as it is necessary to take away the dry soil in which they have been preserved all the winter, and supply them with fresh, ere they can be watered freely. Towards the end of the month, all hothouses should have their temperature gradually heightened, and the heat increased weekly as the season opens. Hot summers and cold winters are what Nature herself enjoins, and they should be realized as far as practicable in every plant-house.

The grand point to be aimed at in the greenhouse, is to keep all the plants sufficiently backward, by free ventilation, and the sparing administration of water, till the sun gets powerful enough to render their developments robust and healthy. The same principles which govern the operation of potting in the stove, must be equally regarded here. No specimen should be transferred to a larger pot unless it actually needs it, and it is better to shift the most vigorous sorts into one merely a size larger, and afterwards repot them in a similar manner when their roots become too compressed.

Succulents, especially the slow-growing globular species, rarely require shifting oftener than once in two or three years, although their roots may be examined annually, and the soil changed if needful. The species of *Epiphyllum,* and the more vigorous growing sorts, are not included in this direction; for they will commonly be found to demand a new pot every year. That clean pots, a perfect drainage, and open friable earth, should be secured for every potted exotic, are trite instructions, and may be supposed familiar to all.

In some collections, the Pelargoniums intended for large specimens in the summer, are, at this period, subjected to artificial heat, and other stimulation. The extra trouble and expense thus caused, are by no means compensated by the results arrived at; for cumbersome plants and pale-coloured flowers can never be so beautiful as smaller and more natural specimens, with a greater quantity of richer blossoms.

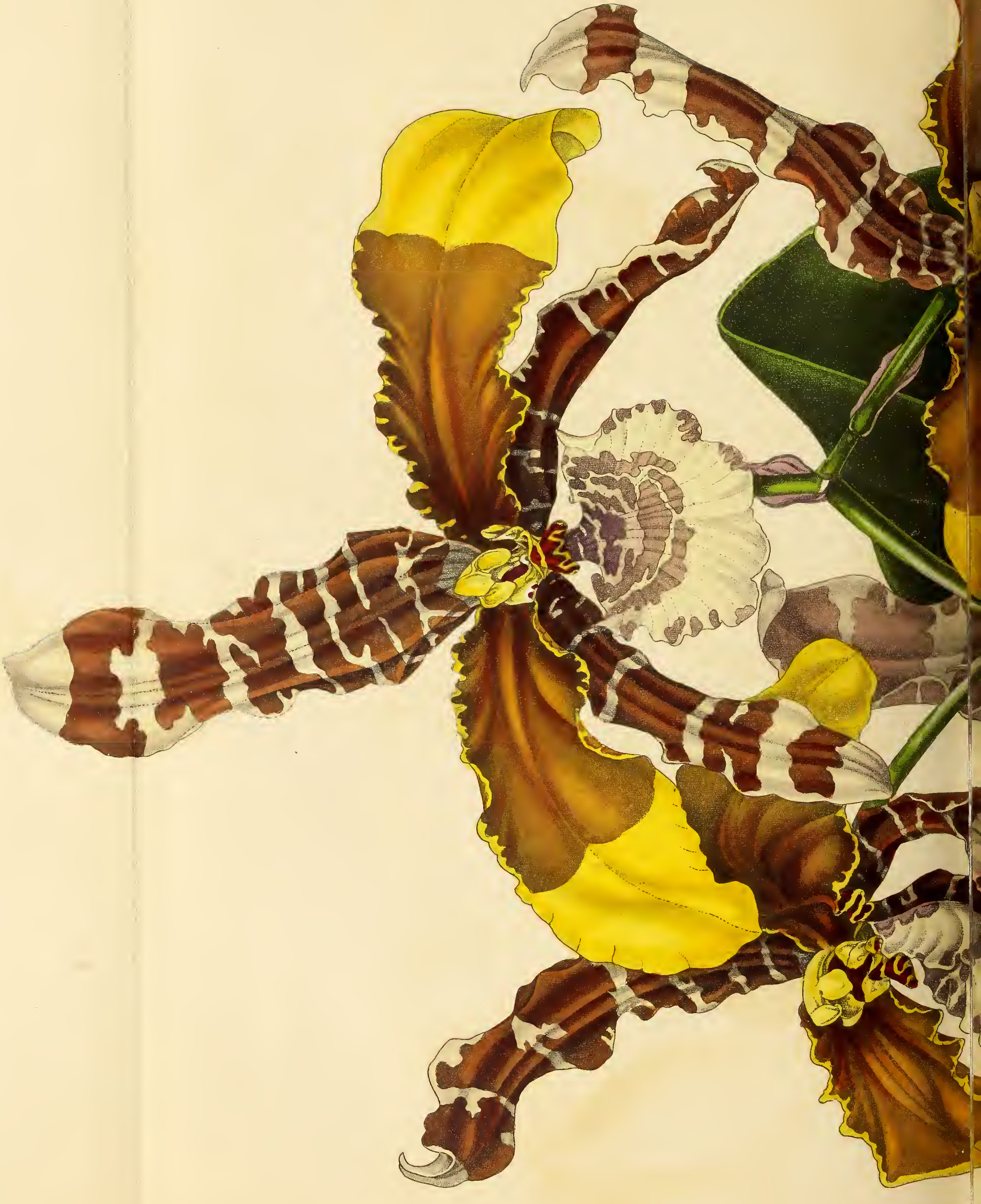
This, and the following month, when the young branches of plants are about half-formed, present the best opportunities for propagation; which may be carried on in the stove, greenhouse, or frame.

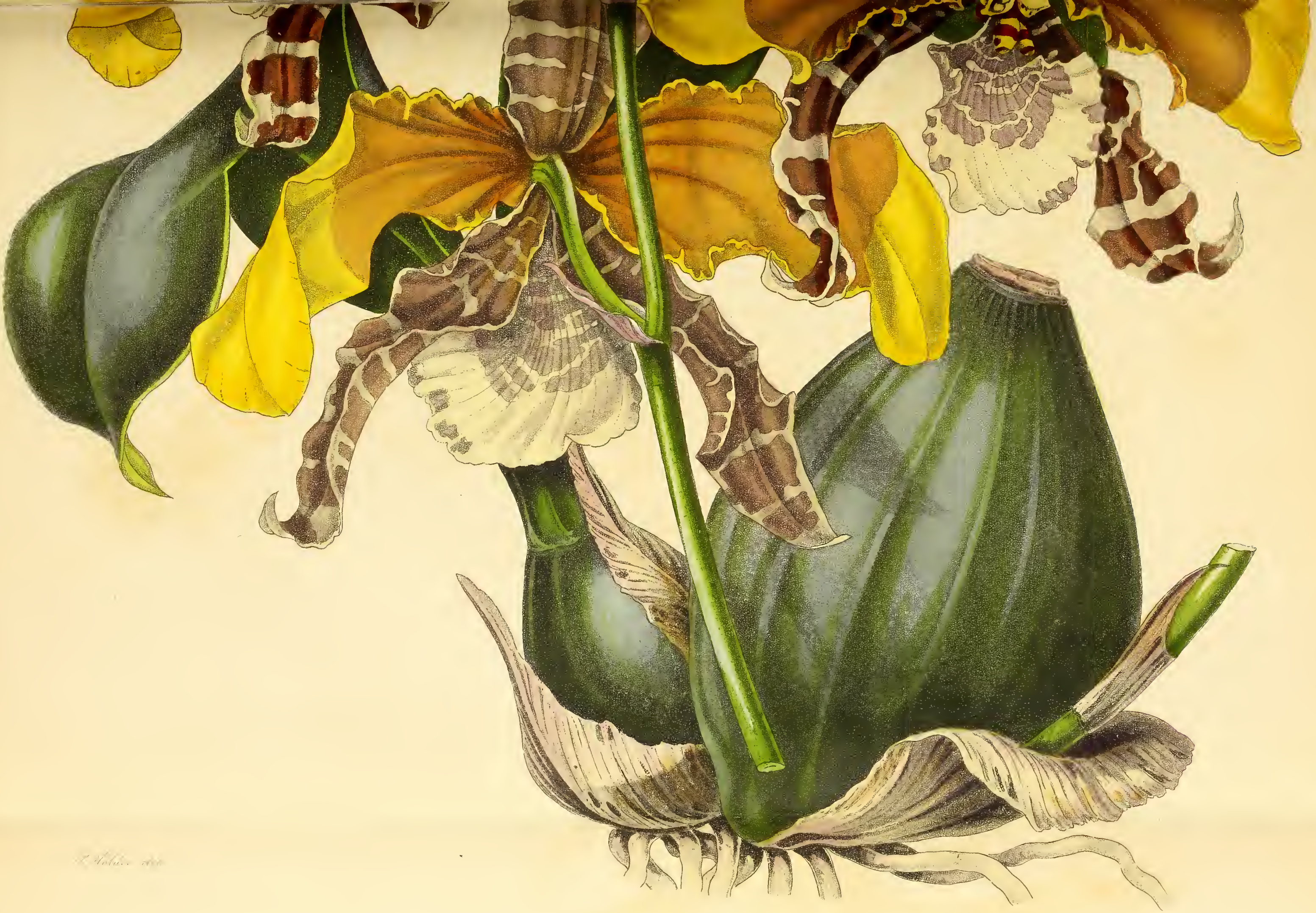
Cultivators who do not possess facilities for storing, during winter, the young stock destined for the flower-garden, now multiply with the greatest possible rapidity all half-hardy plants. Where it can be avoided, however, the operation should not be thus deferred. Plants raised so speedily, and by the aid of an artificial temperature, are never so strong, nor can they flower so abundantly, as those obtained in the autumn.

Sweetwilliams, Wall-flowers, Hollyhocks, and other biennials and perennials, are taken from the reserve-garden as the month of March declines, and planted in the borders where they may be wanted. Annuals also, that have been prepared for early flowering, are transplanted to the beds of the flower-garden in fine weather; and both the hardy and half-hardy sorts are sown in beds or pots, or in the borders where they are wished to flower. This, too, is the season for sowing seeds of every description that were not committed to the ground in autumn.

March is the proper time for pruning dwarf and standard roses, particularly those that are in the slightest degree tender. If pruned sooner, the frost frequently injures or kills the spurs that are left, and materially affects the summer's bloom. Especial foresight must be exercised in performing this duty, however, before growth commences; since, as the uppermost buds are always first developed, and the lower ones thereby weakened, the principal energies of the plant will have been expended on the part that is to be removed, and extreme debility will unavoidably ensue.

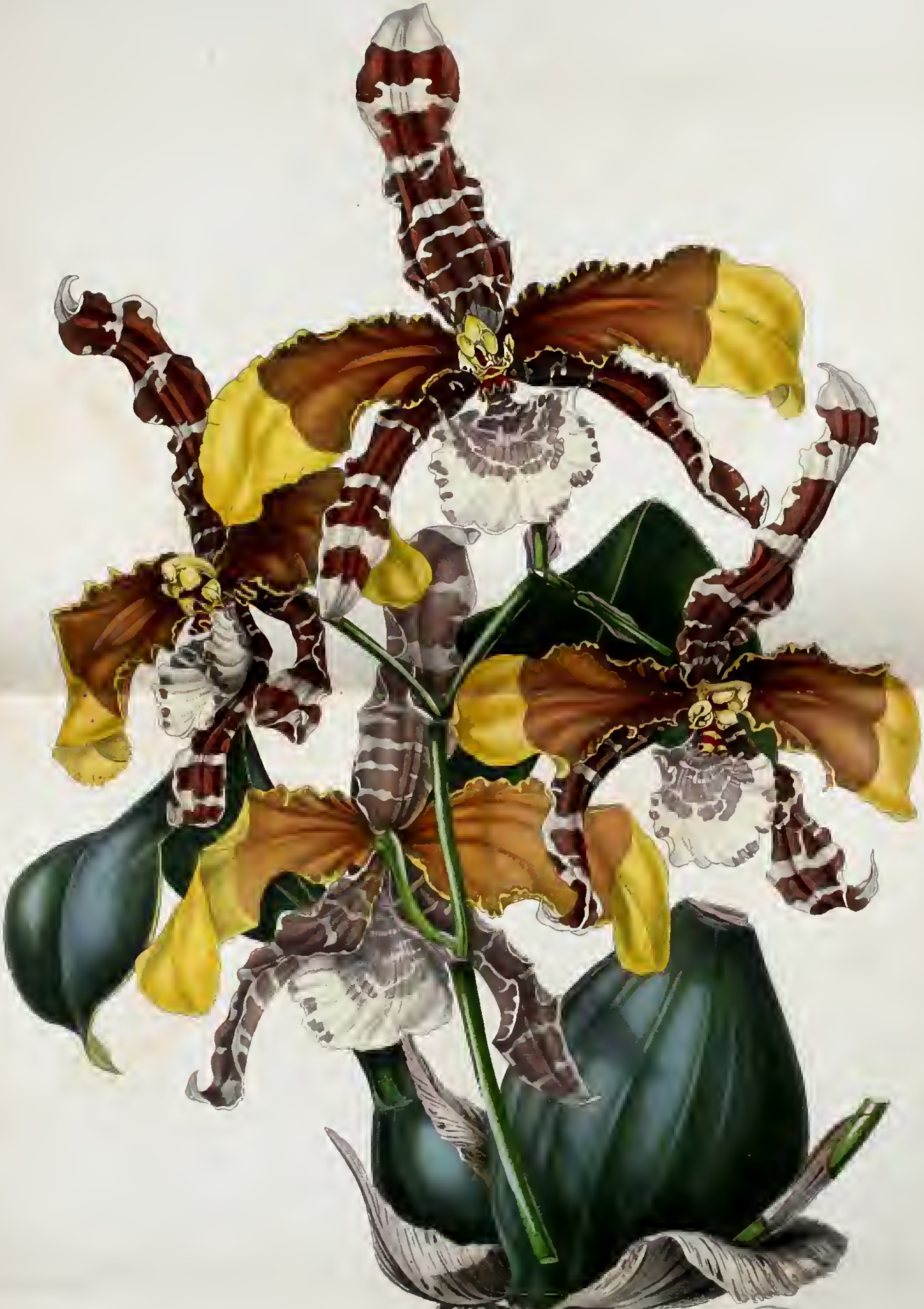
LIBRARY
NO.
PATENT





F. Bolas del.

Odontoglossum grande.



Odontoglossum grande.

ODONTOGLÓSSUM GRÁNDE.

(MAGNIFICENT TOOTH-TONGUE.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

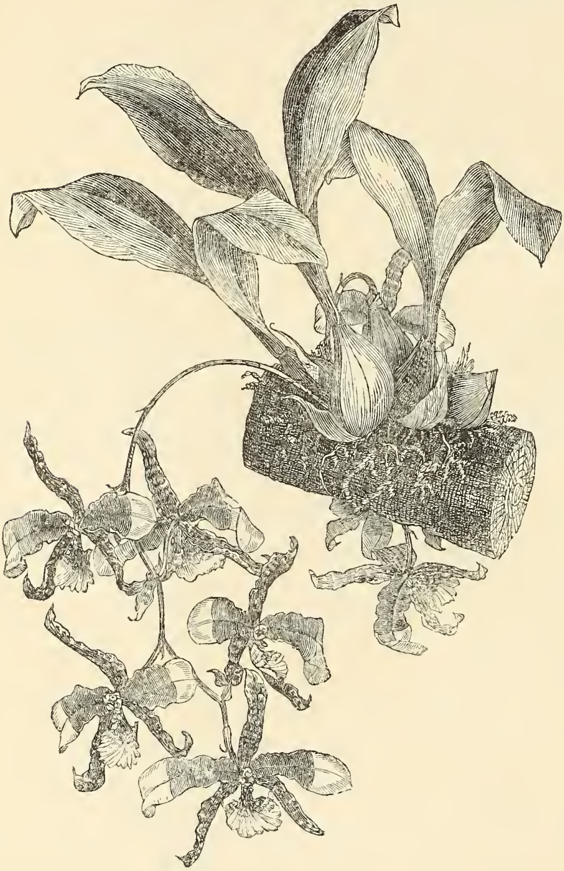
Generic Character.—*Perianth* showy, equal; sepals and petals narrow, acuminate, free. *Labellum* undivided, destitute of a spur, furnished with a short claw, which is continuous with the base of the column; having a crested spreading plate at the base. *Column* erect, membranaceous at the margin, winged on each side of the apex. *Anthers* two-celled. *Pollen-masses* two, solid, with a linear caudicula, and a crooked gland.

Specific Character.—*Plant* epiphytal. *Pseudo-bulbs* large, somewhat oblong, flattened or slightly concave on one side, with sharp edges, pale bluish-green. *Leaves*, as at present produced, comparatively small, rather oblong, acuminate. *Scape* issuing from the base of the pseudo-bulb, bearing many flowers, half-drooping. *Sepals* lanceolate, acuminate, very wavy, whitish, with horizontal irregular brown blotches. *Petals* lateral, oblong, obtuse, with a small point, less wavy than the petals, bright-brown at the lower part, margined and terminated with yellow. *Lip* concave, roundish, white, stained at the base and round the edges with light purple, having two large ear-like appendages, and two beautifully mottled tubercles at the lower part. *Column* yellowish, with two very conspicuous auricles.

A more magnificent plant, with flowers as richly and as variously coloured, or one to which our artist has done greater justice, has certainly never before been figured in this Magazine; in consideration of which, we have been led to deviate from our now long-established custom of furnishing only single plates, to afford adequate room to display its beauties.

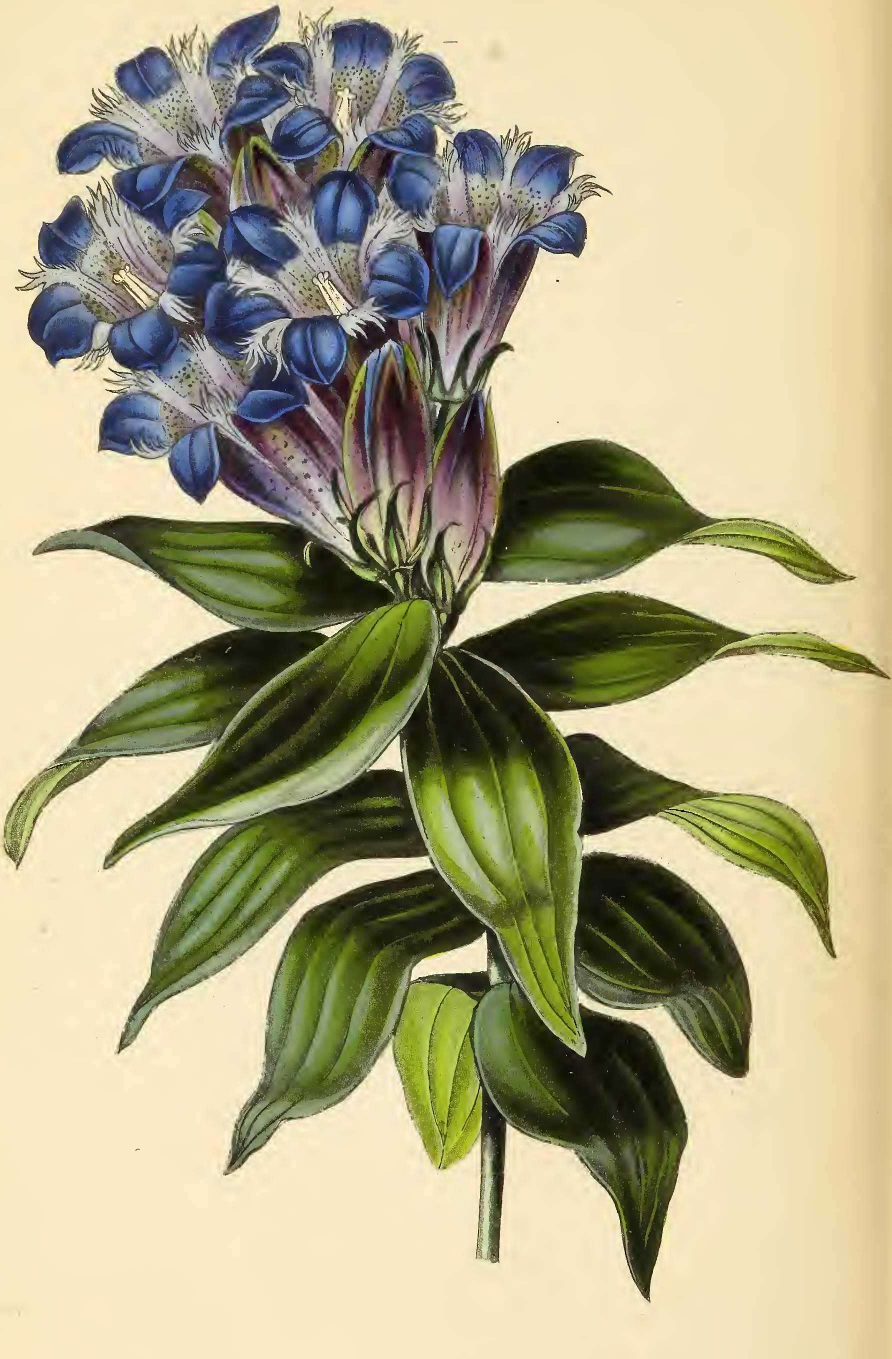
It is altogether a species on which too much praise can hardly be lavished. Being strictly epiphytal, and thriving best on a log of wood, suspended from some part of the Orchidaceous house, its appearance is most characteristic when in blossom; the copious and enormous flowers causing the scape to assume a half-drooping form. But the gorgeous tints and beautiful structure of its inflorescence are beyond comparison the most striking features. From five to six inches is the usual breadth of the flowers from the tip of each petal; the sepals are mottled and barred like the back of a tiger; the brown of the petals is of that rich, smooth, shining character, as to appear an artificial preparation; the lip resembles the upper portion of a cockle-shell in figure, is most delicately stained, and when held to a lamp exhibits a glittering transparency of texture for which other Orchidaceous flowers are so remarkable; while, perhaps, the most pleasing part of all is the splendidly mottled tubercles at the base of the lip, which, viewed from the side, or almost any position, are in the highest degree beautiful, though, as if to attest the fugitiveness of physical beauty, these are the first to fade.

While speaking of the blossoms, we must not neglect to notice, that the specimen of which our drawing is an exceedingly good representation, was by no means strong or luxuriant; so that a more vigorous plant will probably produce finer flowers. We may also remark that the flowers are extremely durable, having, after being detached from the plant when they had been expanded a fortnight, and kept for two days in a packing-case without moisture, remained perfect (with the exception of the small protuberance just alluded to, which shrivelled in a few days) for three weeks, by merely immersing their stalks in water in an ordinary apartment. As it was impossible, from their size, to show the manner in which the species grows, a woodcut is subjoined.



O. grande is now in several collections, but it has not hitherto, we believe, flowered in more than two. J. Bateman, Esq., of Knypersly, Cheshire, first succeeded in inducing it to bloom some time in 1840; and from a specimen which that gentleman imported from Guatemala, and kindly introduced to the gardens of His Grace the Duke of Devonshire, at Chatsworth, blossoms were obtained in December last.

Mr. Skinner, who found this species in several places, states that it flourished most in a temperature of from 60 to 70 degrees Fahrenheit, in damp shady places. The little experience we have yet had in its culture decidedly confirms this declaration. In summer it thrives in a cool house, which is kept moist and shaded; and may either be fastened to a block of wood, or planted in a pot filled with sphagnum moss, in which it roots freely. Dryness and a very moderate temperature are desirable through the winter; and it may be propagated in the usual way.



Gentiana septemfida.

GENTIÀNA SEPTÉMFIDA.

(SEVEN-CLEFT GENTIAN.)

CLASS.
PENTANDRIA.

ORDER.
DIGYNIA.

NATURAL ORDER.
GENTIANÀCEÆ.

Generic Character.—*Calyx* four or five-cleft. *Corolla* funnel-shaped, rarely salver-shaped, with a marked throat. *Limb* five-cleft, without any accessary segments. *Stamens* five. *Anthers* free, incumbent. *Filaments* flattened. *Stigma* two-lobed, usually sessile. *Capsule* one-celled. *Seeds* roundish or oblong.

Specific Character.—*Plant* perennial, herbaceous. *Stem* erect, roundish, smooth, from nine inches to a foot high. *Leaves* in alternately opposite pairs, dense, ovate-lanceolate, distinctly three nerved. *Flowers* in a terminal cluster of from two to six, and upwards, sessile. *Calyx* tubular, with long, awl-shaped teeth or segments. *Corolla* campanulate, with a nearly cylindrical tube, expanding a little at the mouth, of a greenish or bluish brown externally, spotted within, and having a flattish blue limb, generally composed of five lobes, with intermediate laciniated segments. *Stamens* slightly swollen in the middle. *Germen* spindle-shaped. *Stigma* two-cleft, ultimately revolute.

In the charming genus *Gentiana*, there are some species which grow to the height of only a few inches above the ground, and bear solitary flowers, of which *G. acaulis* is a well-known example; while others have stems from six to eighteen inches high, and large clusters of six, eight or more blossoms. Of the latter class, the brilliant *G. gelida* affords an excellent illustration; though *G. Pneumonanthe* is a more common one, and our present subject is better still, as it can be directly examined in connexion with these remarks.

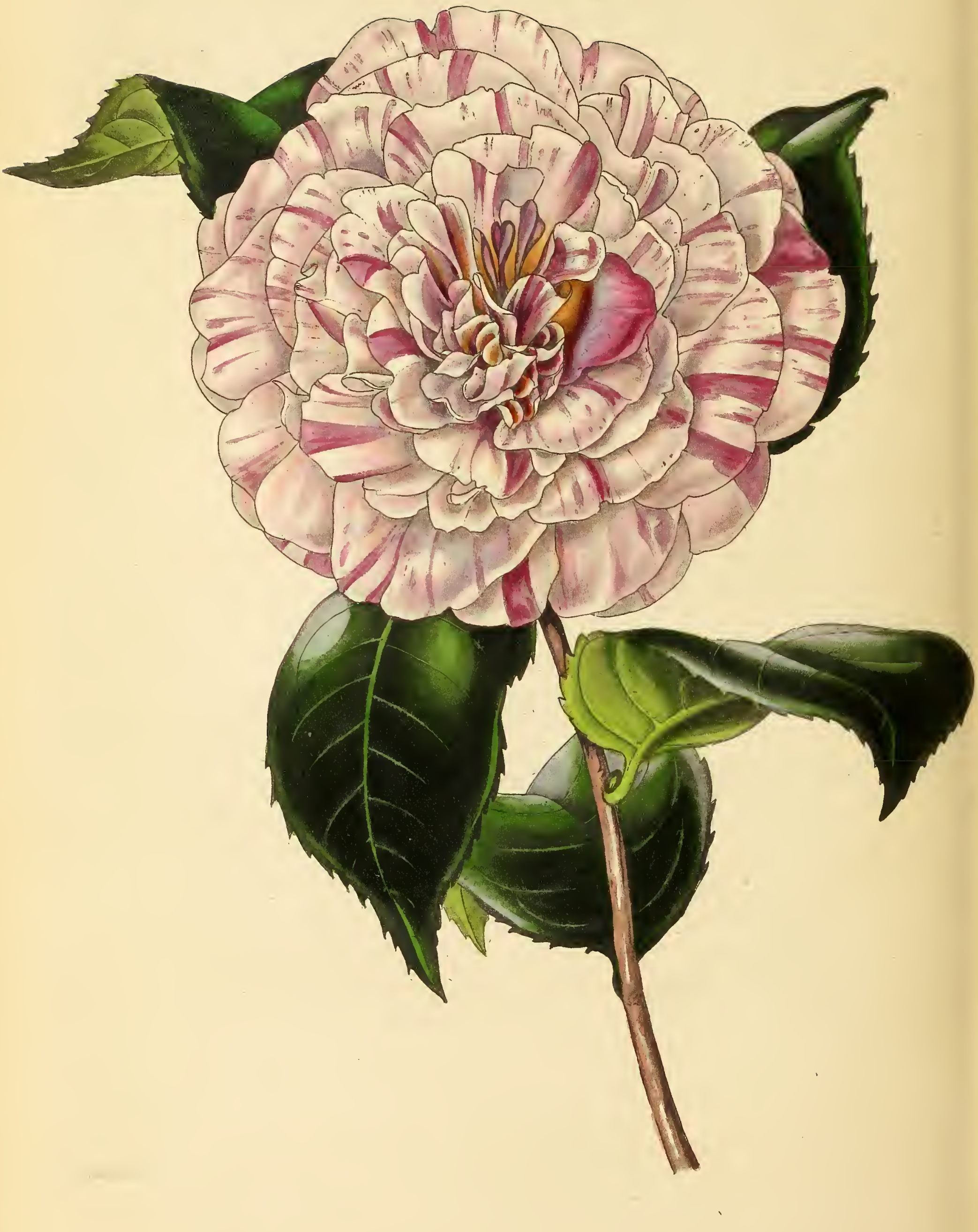
Of those, again, which are included in the last description, next to the average height of the plant, the form of the leaves, and the different arrangement of the flowers; the length of the tube of the corolla, and the dilation or flatness of its limb, furnish the readiest marks of distinction, the colour being rarely varied. In the case of *G. septemfida*, however, the profuse spottings of the inside of the flower constitute a trifling point for recognition; but the crowded disposition of the foliage, the long, upright, and but slightly swelling tube of the corolla, the comparatively limited breadth across its orifice, and from point to point of opposite petals, and the closeness with which the blossoms are aggregated, are the principal criteria by which it may be distinguished.

It was introduced from Persia more than thirty years ago, and inhabits various alpine districts of the Crimea, of Mount Caucasus, and of the shores of the Caspian Sea. Believing that the genus of which it is a very worthy member, and the species itself individually, are but inadequately esteemed and cultivated, we had the accompanying figure prepared from a plant that blossomed most beautifully in the excellent collection of Messrs. Young, of Epsom, about July, 1840. Its great merits are the extreme abundance in which it flowers—a fine specimen generally producing five, six, or a larger number of spikes equal to that depicted—and the capacity it possesses of thriving in an ordinary border, as well as rapidly increasing in size.

At the Epsom nursery, where a peculiarly extensive variety of these delightful little plants exist, some are kept in pots, in a shaded situation, throughout the summer, and placed in a cold frame during winter; the rest being planted in a corner of the garden which is well screened by hedges. Those in the former position are safer, because they can be more effectually preserved from moisture in winter, though the others are seldom injured from any source.

When grown in the open ground, it seems especially desirable to secure them against worms, ants, &c., which do not eat or deface them, but cast up the earth into the cavities formed by the axils of their leaves, and thus either smother their tender shoots, or cause water to collect around them, to their serious damage or destruction. To remedy this, with the lower kinds, a stiff adhesive earth is to be selected; while around the base of such as that now under consideration, a few small pebbles may be laid, which will obviate the necessity for any other than the most common soil.

By dividing the plant in the spring, a multiplication, equal to the rate of growth of the species, can be at once ensured.



Camellia Japonica Albertii.

CAMÉLLIA JAPÓNICA; *var.* ALBÉRTII.

(PRINCE ALBERT'S JAPAN CAMELLIA.)

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

NATURAL ORDER.
TERNSTRÖMIÀCEÆ.

Generic Character.—*Calyx* five-parted, coriaceous, surrounded below with many smaller scales. *Petals* five or more, large, joined at the base, encircling a hypogynous disk. *Filaments* united below into a crown, attached to the petals. *Anthers* nearly ovate. *Germen* many-seeded. *Style* one. *Stigmas* three. *Capsule* coriaceous, pulvinate, or abortively globose, three-furrowed, three-seeded.

Specific Character.—*Plant* shrubby. *Leaves* alternate, coriaceous, acutely serrated, acuminate. *Flowers* axillary or terminal, subsessile or pedunculate, single or double.

Var. Albertii.—*Flowers* perfectly double; outer petals roundish, emarginate, lying somewhat flatly; central ones small, partially erect, of various forms; of a whitish or light blush-coloured ground, irregularly striped or blotched, longitudinally, with reddish pink.

The varieties of *Camellia* continually raised in British and continental gardens now almost exceed calculation; and the forms and colours of many approach so near to those of others previously named, that it becomes nearly as difficult a task to distinguish them, as it is to attach the proper name to what are termed florist's flowers. Indeed, if the *Camellia* is not soon ranged under that comprehensive phrase, it will not be because the garden productions from it are not sufficiently numerous, or their differences slight enough to render the descriptions of them as intervolved and intricate as those of any recognised florist's flower.

Some time having elapsed since a new variety was introduced from its native regions, any such importation must necessarily be a novelty in more than one sense. Consequently, the present beautiful sort, sent to the celebrated collection of Messrs. Chandler, of Vauxhall, from China, is much esteemed by connoisseurs, and will, no doubt, be as favourably received by the public at large. In its principal features, it is certainly not far removed from some previously cultivated kinds; but it is, unquestionably, a very superior plant. The leaves are of that deep green, glossy, healthy-looking character, which makes its congeners so much admired as evergreens; and there is none of the sickly, yellowish, or dingy appearance about them, for which a few are peculiar. The flowers are of a fine round figure, with pleasingly rounded and well-disposed petals, very double, nicely filled up in the centre, and containing a combination of colours which, of all others, is least liable to vary. A red, crimson, or dark rose-coloured ground, with light or white blotches, spots, and stripes, is universally known to be as changeable, in *Camellias*, as the circumstances in which, by whatever chance, they may temporarily exist about the flowering season. Thus the flowers of that class most in requisition often disappoint the culturist, by coming entirely of one colour, and altogether lacking the variegation to which they owe their high standing. But the blossoms with a white ground, or any tint approximating to white, in whatever way they may be otherwise painted, rarely lose these peculiarities; and are, therefore, more valuable.

No one is ignorant of the culture of *Camellias*. A moist and very moderate heat after the flowers have fallen, and while they are growing and forming their flower-buds, with large supplies of water at the same period, both to the roots and over the foliage; and a cool but not dry situation throughout the remainder of the year, with an aspect which will not admit of the more powerful of the sun's rays acting upon them, are the great desiderata. Messrs. Chandler always pot their *Camellias* in the autumn, about the month of September; and a mixture of loam and heath-soil, both of a turfy nature, is preferred.

These gentlemen received the present variety a few years since, and it first bloomed with them in the spring of 1839. From a specimen which flowered about the beginning of 1840, our drawing was taken. The name here adopted was applied by Messrs. Chandler, in compliment to His Royal Highness Prince Albert, who is said to feel a considerable interest in flowers.

OF GARDENING AS A SCIENCE.

NO. III.

THE reading public have long been tutored in error by those who have been considered physiological authorities : this is a sweeping and somewhat bold assertion; but we are led to make it by the perusal of a work by a scientific German physician, which has recently appeared, and which promises to create a great sensation, perhaps an entire revolution, in the study of vegetable physiology; we allude to "*The Organic Chemistry*" of Liebig. As an analytic chemist, the author ranks inferior to none ; and the views he takes of the chemical processes engaged in the nutrition of vegetables are so striking, that it becomes imperative to direct our attention to them in the course of these articles, in order to exhibit truths which heretofore have escaped the notice of the learned: we extract a few leading paragraphs now, appending such comments as may be required to render more lucid the admirable views of the author.

To understand the culture of a plant, the elements which constitute, or exist in its structure, must be known ; therefore, the first part of the work is "devoted to the examination of the matters which supply the nutriment of plants, and of the changes which these matters undergo in the living organism." Subject to the operation of the vital principle of a plant, which must never be lost sight of, it becomes an object of the greatest moment to determine what the organs of a vegetable, (that is, its tissue or structure,) and the fluids they contain, are composed of; for if these be ascertained, the gardener is prepared to supply it with those substances which can be converted into nutritive aliment ; whereas, if he be ignorant of these leading points, he is just as likely (as indeed it constantly happens) to poison his plants, as to promote the healthy development of their structure ; for "the food which can serve for the production of *all* the organs of a plant must necessarily contain all its elements." We will number our quotations :—

1st. "The substances which constitute the principal mass of every vegetable, are compounds of carbon, with oxygen and hydrogen in the proper relative proportions to form water. Woody fibre, starch, sugar, and gum, for example, are such compounds of carbon with the elements of water. In another class of substances containing carbon as an element, oxygen and hydrogen are again present, but the proportion of oxygen is greater than would be required for producing water by union with the hydrogen. The numerous organic acids met with in plants, belong, with few exceptions, to this class. A third class of vegetable compounds contain carbon and hydrogen, but no oxygen, or less of that element than would convert the hydrogen to water. These may be regarded as compounds of carbon with the elements of water and an excess of hydrogen. Such are the volatile and fixed oils, wax, and the resins. Many of them have acid characters. The juices of all vegetables contain organic acids generally combined with the inorganic bases, or metallic oxides; for these metallic oxides exist in every plant, and may be detected in its ashes after incineration. *Nitrogen* is an element of vegetable albumen and gluten; it is a centient of the acids, and of what are termed the 'indifferent substances' of plants, as well as of those peculiar vegetable compounds which possess all the properties of metallic oxides, and are known as 'organic bases.' It follows from the facts thus far detailed, that the development of a plant requires the presence—first, of substances containing carbon, and nitrogen, and capable of yielding these elements to the growing organism: Secondly, of water and its elements; and lastly, of a soil to furnish the inorganic matters which are likewise essential to vegetable life."

In this quotation, given at length, we recognise the leading principles of vegetable culture: the main facts are not new, neither are they doubted by any philosophic observer; but they have been misunderstood, and misapplied, as we shall discover in due time. It has been, and will be, our desire to avoid all dark and mysterious terms—terms exclusively professional; but as those who allude to science must, to a certain extent, employ its phraseology, we have now cited terms which are in the mouth of numbers, and are to be heard every day, though, in point of fact, they are little understood, and still less appreciated.

In order to convey some idea of their express meaning, we shall say a few words upon each of the vegetable constituents above-noticed, though not strictly in the order in which they occur.

1. Carbon. This word implies coal, or charcoal, and is most readily interpreted by referring to the charcoal of wood—that substance which remains after the slow combustion of wood, particularly in those close iron retorts which are employed in the manufacture of pyroligneous acid. Its quantity is very great, though various, and may in the gross be stated as approaching to something under half the entire weight of the dried wood. Carbon also enters largely into the composition of all vegetable products.

2. Oxygen, as far as we know it, is an air or gas:—it is that vital principle of the atmosphere which sustains respiration, light, and flame; it exists invariably in the proportion of 21 parts of every 100 parts of air by measure, and that at every season.

3. Nitrogen is that inert, inactive portion of air which remains after the removal of the oxygen; it constitutes the bulk of atmospheric air, in volume amounting to 79 parts of every 100 parts: it is not respirable, cannot support flame, and is fatal to life; its presence may be easily shown by placing a lighted taper under a large bell-glass, the rim of which is immersed in water to prevent the access of air. As the taper burns the water will rise within the bell-glass, and when the flame is extinguished, (which it soon will be,) the fluid will leave its mark at a place which will prove that about one-sixth of the air has been removed: this will be an approximation to the truth, though the experiment admits of much inaccuracy.

4. Hydrogen is the basis of water; it exists throughout nature wherever that fluid, or moisture derived from it, exists. Detached from water, it is revealed as a gas, the lightest of all things that have appreciable weight; it therefore has been adopted by chemists as the unit upon which the comparative atomic theory establishes its specific weights. Hydrogen unites with oxygen in the proportions by weight as 1 is to 8; and by these figures the weight of water is expressed:—and by measure in the proportions of 2 hydrogen to 1 oxygen. These aërial elements being thus blended in the above-mentioned proportions, explode violently with a flash of light if the smallest electrical spark be passed into the mixture, and watery vapour is produced.

If a stream of voltaic electricity (galvanism) be passed through water, the two constituent gases of that fluid are again developed in the proportions above-mentioned.

The phenomena attending this electrization of water are so astounding, that we feel obliged to refer to the "New Researches on Electricity," by Dr. Faraday, of the Royal Institution, in order to convey any adequate idea of them. "*One grain of water* will require an electric current to be continued for three minutes and three quarters of time to effect its decomposition, in quantity sufficient to retain a platina wire $\frac{1}{104}$ of an inch in thickness, of any length, red hot, in contact with the air." This quantity is presumed to be equal to "800,000 charges of a Leyden battery, charged by thirty turns of a very large and powerful plate electric machine." "The chemical action of a grain of water upon four grains of zinc can evolve electricity equal to that of a powerful thunder-storm." These passages occur in series vii. p. 250—7; and they suffice to convey "an almost overwhelming idea of the extraordinary quantity or degree of electric power which naturally belongs to the particles of matter."

We have thus slightly glanced at the chemical, or rather electrical, elements of vegetables and plants; not with any object to introduce chemical discussion, but to render it manifest that horticulture can never be duly understood or correctly applied until its principles be determined. In common with agriculture, it must be scientifically investigated by professors duly qualified to analyze and instruct; and the world is deeply indebted to Dr. Justus Liebig for the work just published, wherein he has distinctly proved that cultivators are wandering in the dark at the very time when means are at command, were they duly applied, to remove difficulties and obviate perplexities by the establishment of positive facts.

The practical gardener, if he duly appreciate the quotation and remarks, will see at a glance the reason of his embarrassments and failures: he will also be sensible of the wondrous mechanism which he superintends; he will perceive that from the four elements described, all the specific fluids of his plants, their chemical and medicinal principles, their sapid and odorous qualities, are derived; and therefore, if a plant do not meet with its proper aliment, or rather, if it be exposed to agents which disturb the natural assimilations, a morbid action must be induced, and disease follow. But, again, plants must be duly supplied with *inorganic* substances, and such are all that are not the products of vital organization ; earths, metals, potassa, and soda. Hereafter we shall have occasion to allude to these more particularly ; it will now be sufficient to observe, that they are derived chiefly from the soil, and, therefore, in the culture of the floral department, and of all plants in pots, the gardener is peculiarly liable to commit error, and incur vexatious contingencies.

Vegetable physiologists, seeing the impossibility of introducing any solid substances through the porous system of the roots, have been tempted to refer to carbonic acid, dissolved in, or united with, the sap, as the prime source of vegetable nutriment ; and, following up this view, agriculturists have adopted the modern theoretic notions respecting humus and humic acid. We are mere infants in experiment, and what we *know* may be comprised within a nutshell ! But we are arrived at a period of research, and experiments now assume a direction which promises to lead to precise results. Heretofore we have seen them conducted upon detached parts of plants—mere mutilations ; " Can," we ask with Liebig, " the laws of life be investigated in an organized being which is diseased or dying ;" and is not " the mere observation of a wood or meadow infinitely better adapted to decide so simple a question, *than all the trivial experiments under a glass globe ?* "

The question is pregnant, and can only be solved by research.

STANDARD PORTUGAL LAURELS AND RHODODENDRONS.

To assist in imparting variety to a pleasure garden, and conduce to the augmentation of its ordinary charms, it has long been the practice to prepare, by grafting or budding, a number of low standard trees or shrubs, such as Roses, Robinias, weeping Ashes, &c., and intersperse them among other kinds on the lawns and in the flower-beds. For a formal flower-garden, disposed in the geometrical style, such kinds of ornaments are peculiarly appropriate ; and the Roses may be very properly pruned to a close round head, to correspond with the regularity of the plots among which they are placed. But when they are planted on a lawn near the mansion, the tasteful cultivator will allow them to grow much more freely and wildly, and to assume a more spreading and drooping character.

All the shrubs, however, that are commonly used for this purpose, shed their foliage annually ; and, in winter, present to the eye nothing but bare branches. When the architecture of the dwelling is of the Grecian or Italian order, and a broad straight walk ranges along its front, with one or more similar walks passing from it at right angles, it is customary, where orange-trees are possessed, to place them at certain distances along the sides of these during summer, in order to give the garden a more purely Italian aspect, and assimilate it, in some degree, to the style of the house.

Our readers may not all be aware that to effect this end more permanently, or at least create an allusion to Italian scenes by having lines of round-headed evergreen trees on each side of the principal lawn fronting the mansion, an effort has been successfully made at Chatsworth and other places to train Portugal laurels to a single stem, from six to eight feet in height; and afterwards induce them, by slight prunings, to form a large, dense, and somewhat globular head. From the slow progress of the tree, and the check which frequent pruning must naturally occasion, many years are required to produce a perfect specimen of the class; yet, when that period has elapsed, and the object is attained, all who have recently visited Chatsworth will agree that it is a system eminently worthy of imitation: for not only are the trees thus procured well adapted to the situations we have named, but they are also valuable for planting in rows down each side of the central walk, or in the middle of other compartments, of the flower-garden, since they add an air of liveliness to it through the winter which it would otherwise wholly want.

The preparation of trees of this kind is extremely simple. As soon as they are ready for removing from the seed-bed, those most likely to answer the purpose are selected, and all their branches cut off closely save the central one. The same operation is performed subsequently late in the autumn of each succeeding year, and if the young stem is inclined to be weak, or does not grow erectly, it is supported by a stake. When the requisite height is reached, the main shoot is then shortened; and by a little judicious annual reduction of the branches, a bushy compact head is obtained in a few years.

It has been suggested that a species with lighter green foliage, and greater rapidity of growth, as the common laurel, would, if grafted standard high on the Portugal laurel, have a more interesting appearance, and realize the intention much more speedily. The common laurel is, however, from its straggling habit, and the disposition it manifests to display its naked branches, totally unfit for the purpose; while the objection that always attaches to grafted plants, would apply to this with increased force. It would be seen by every one that the process of bringing it to that state was entirely artificial, and the appearance would ever be unnatural and monstrous. In the Portugal laurel, on the contrary, the trees look as natural as is at all to be desired, and their stems have a very proportionate thickness to the bulk of their summits.

Besides the Portugal laurel, we have to notice some specimens of standard *Rhododendrons* in the garden of R. Barclay, Esq. Bury Hill, near Dorking, with which we were greatly pleased in the autumn of 1839. Mr. Scott, the experienced gardener at that place, informed us that the only attention they had received was a slight pruning in the early stages of their growth. All the side shoots were cut off, and the stems were from four to five feet high, with fine branching heads three or four feet in diameter. These were quite young plants; and there can be no doubt that, when they arrive at a greater age, they will be magnificent objects.

The sorts operated upon were superior varieties of *R. ponticum*. It was evident that, by a similar process, standard *Rhododendrons* could be procured six or eight feet in height, and without waiting a very lengthened period for a satisfactory result. The well-known tendency of the lower branches of this shrub to become decumbent after acquiring a certain length, renders it probable that a moderately old specimen of a standard would form a beautiful drooping miniature evergreen tree; which, when loaded with its showy blossoms, would be surpassingly attractive. The ease with which the experiment might be instituted, and the certainty of at least an interesting effect being produced, are urgent recommendations of the plan here briefly sketched.

THE NATURALIZATION OF EXOTICS.

As it should be one of the principal aims of every writer to render his meaning clearly apparent, we deem it desirable to begin this paper by showing how far the term employed in our title is applicable to the process of which we treat. In its strictest sense, naturalization may be understood to imply such an adaptation of the habits of plants or animals in a particular country, that, if left to themselves, they will flourish and propagate their species, almost or quite as freely as in their native districts.

With regard to vegetable productions, and, primarily, the more immediate subjects of present remark, no such extended scope can be allowed to the word. Its use here is simply to express that modification of constitution or development, by which certain species, inhabitants of warmer latitudes, are enabled to sustain the changes of our climate, and to thrive uninjured in the open ground at all seasons.

Whatever doubts may exist as to the possibility of effecting the complete acclimatation of any exotic, the fact is beyond dispute, that the limited alteration just mentioned has been accomplished in innumerable cases. It is a matter of no importance whether the organization of a plant is, or is not, at all affected during the process, or whether its powers can be radically changed. All that need be urged is, that although, when first introduced, or transferred from a protective structure, many species retain habits, periods and modes of growth, a tenderness of tissue, and a consequent susceptibility of damage, which imperatively call for shelter during several months of the year; they will, after a longer or shorter exposure, and by a little timely and judicious assistance from the cultivator, so conform to the natural seasons, and so regulate the exercise of their functions by the ordinary vicissitudes of temperature, as to become capable of dispensing altogether with the aid of art, except in a rare and remarkable combination of adverse circumstances.

It is interesting, and, in connexion with this inquiry, peculiarly useful, to recall to memory the numerous instances of plants that have been treated as greenhouse or stove species, afterwards ranking among the hardiest of our trees and shrubs, or being only covered in extremely severe weather. The valuable Larch, one of the most robust of all our timber trees, was originally placed in a house, until it was accidentally discovered that it grew better in the open air, under every conceivable disadvantage. Every one is aware that *Aucuba japonica*, which endures cold better than some of our commonest evergreens, was once consigned to a stove. *Pæonia Moutan*, a shrub that very seldom needs shelter, was similarly treated by the early cultivators. Were it necessary, a hundred other plants might be adduced, whose culture has undergone a like revolution, but we have now rather to deal with principles than examples.

There are not wanting, however, those who account for all such effects, by asserting that every plant at present grown in British gardens was always equally hardy, had its capacity been fairly tested—a position which we have no inclination to dispute, any farther than it applies to the same species in different countries. That many of the hardy exotics which now adorn our pleasure grounds would, if at once transferred from their native soil, or from a common greenhouse, have speedily perished or been greatly damaged, if not in some way preserved from the prejudicial action of the atmosphere, at stated periods, we distinctly and unreservedly affirm. Indeed, this must be too obvious to admit of a doubt; for the wood formed in a warmer climate must necessarily be tender, and the time of development is generally earlier, or at a very remote season.

Leaving the question of ultimate utility entirely out of consideration, the taste for naturalizing ornamental exotics is now so laudably prevalent, that any hints which may tend to secure success therein, will, we are certain, be duly esteemed; and we therefore purpose here to record a few which have presented themselves in the course of our observation. The best locality,—its preparation,—the proper soil,—the kind of plants most suitable, and their management prior to planting,—with the subsequent culture and protection of the specimens; each forms a topic on which we shall separately enlarge.

Perhaps of all these, the one first proposed is of the most vital moment. Planters sometimes seem to imagine, that it cannot matter in what part of the garden or grounds a specimen is placed, provided it be partially surrounded with high trees, or other objects which will fulfil the office of screening it from the blasts common to particular quarters. The altitude of the spot, its distance from lakes or rivers, the flatness, undulation, or slope of its surface, the depth of the upper stratum of earth, and the character of the subsoil, are too seldom taken into account; and yet they concur to cause all the singular diversities of climate which distinguish counties, parishes, or districts, and exert such a powerful influence on plants.

In a recent paper, it has been proved that hilly tracts are the most favourable for half-hardy ligneous plants, on account of their being above the moisture which always accumulates in valleys, and freer from frosts. A sloping piece of ground has also been recommended, for the superior manner in which it must naturally be drained; besides which, if facing the south, or any proximate point, the cold winds from opposite quarters are warded off by the hill itself. Any plain, however, occurring on its side, is fully as appropriate, and even more so to some plants; the general intention being that the spot should be elevated, and not an extensive flat.

A shallow surface-soil is the next desideratum, with a substratum of a rocky, gravelly, or very sandy, but by no means of a clayey or wet nature. Where both these are unattainable, the only substitute is a most efficient system of drainage, and, if practicable, the deposite of a layer of rough stony matter, about eighteen inches or two feet below the actual surface, to prevent the roots from penetrating too deeply.

The philosophy of these provisions will be easily understood. By keeping the roots near the top of the ground, and guarding against superfluous water, the plants will be nearly as much beneath the cultivator's control, as if they were grown in pots. That disposition which they ever evince to become too luxuriant when the roots are unconfined, will be effectually checked; they will be better able to mature their developments; from containing less moisture in winter, a diminished liability to injury from frost will be experienced, and they will be less likely to commence growing prematurely in spring; by the flowering species, blossoms will be more speedily produced; and there will be a much greater chance of ripening seeds or fruit.

Properly to second the above preparatives, the soil should be wholly renewed, if it be not precisely such as would have been selected. One of the chief ingredients must be a fine sharp sand, and the great bulk of it may be a light friable loam, in which sand naturally exists. This will be seen to be far from a nutritive earth; the object being rather to repress than excite exuberance of growth, and to obtain a medium that is not strongly retentive of fluids.

To choose species and specimens best fitted for the purpose, the exercise of sound discretion is requisite. Deciduous kinds are palpably those most calculated to cause good results, though evergreens are unquestionably the most ornamental and valuable. For the former, consequently, the least attention is demanded, while the latter better repay the trouble they occasion. Plants of each description may, therefore, be indifferently selected; simply taking care that they be sufficiently beautiful to merit distinction, and that, from the latitude of their native locality, or the height at which they are found above the level of the sea, reasonable grounds be afforded for believing that the experiment will issue favourably. One important condition is not, however, to be forgotten. When a great discrepancy exists between the temperature of the country in which they are wished to be naturalized, and that from whence they are brought, unless their habitude is dwarf, and their growth ascertained to be slow and easily perfected, there is a great probability of failure.

Where procurable, small seedling plants are decidedly most proper for experimenting upon. Independently of the facility with which they may be protected, their inferior value, and the smaller space they occupy; they can accommodate themselves, with less difficulty, to any peculiarities of climate than older specimens, and their habits will be more completely conformed to the circumstances in which they are placed. It is indispensable that the seeds be germinated without the application of, or with as little as possible, artificial heat; and that they be inured to the open air for some time previous to transplantation.

If specimens that have been raised from cuttings, and kept for years in the greenhouse, are desired to be acclimatized, it will be prudent to employ those which have been subjected to the greatest variations of temperature, and, in all respects, least carefully tended, and to expose them freely, for months or years, before their final removal to the ordinary atmospheric influences; since their danger from cold, while in a pot, will be very much less than after they are planted out, and the measure will be an excellent preliminary to their more thorough liberation.

A point to which little attention appears to have been given, but which is of the utmost moment, is the season of transplantation. We have frequently seen individuals, of considerable standing in the profession, plant tender shrubs in the flower borders during the autumnal months; and, as if to aggravate the impropriety, they have often been large specimens, which had been retained through the summer in the greenhouse. The consequence of such a step might have been anticipated: the plants invariably died in the ensuing winter, when the weather was severe. Experience has demonstrated to us that, by transferring a greenhouse plant to the borders at that period, a new development will be immediately induced, which for want of due light and heat to ripen it, is unavoidably destroyed by winds or frost.

For planting out all kinds of exotics, whatever may be their size, the only reasonable or defensible period is the early spring; *i. e.*, the last week in March or the first in April. If planted later, they will have begun to make a feeble progress; whereas it will be easy to cover them with a mat, or, when very small, an inverted garden-pot, should cold weather follow. Throughout the winter before, they must be kept in a cold-pit or frame without fire heat, and sheltered solely from sharp frosts. It is especially to be desired that they be in no way stimulated to begin their growth sooner than the natural season.

After planting, it will be as necessary to guard them from the cutting winds that occasionally occur as from spring frosts; and at no stage of their progress will they require so much care as in the first year; during which it will be perceived that while water can readily be supplied by hand, no ingenuity can displace it from the soil, or deter the plants from imbibing it too profusely if it superabounds. Hence the value of the drainage, &c., already suggested.

To protect the plants on which we have been disserting, numerous expedients are resorted to by different individuals. Garden mats, baskets of wicker-work, straw hurdles, and other methods meet with supporters according to the predilections that prevail. At Chatsworth, where extensive shelter is required, huts made of plaited straw, about an inch in thickness, covered with a small thatched roof, and maintained in their proper position by spars or stakes of wood being interwoven with the straw, are found extremely serviceable, as they exclude wet as well as frost, and thus subserve two important ends. Any favourite mode may be adopted that ensures an adequate protection without bringing the branches of the plant in contact with it, and which allows of air and light being liberally admitted in fine weather. With evergreens, no means should be employed for fastening the branches into a smaller compass, and the plants can be covered exactly as they stand. Deciduous species may have their shoots slightly drawn together to save materials, and give their outline a more suitable shape ; but they must not be too closely confined. Those taken from the greenhouse, will sometimes protrude their leaves and shoots sooner than the common shrubs ; for which reason the protection ought to be continued somewhat later, with increased care, however, to provide them with air and light. After the external screen has been discontinued, a winter's layer of litter over the roots will usually be beneficial.

Two facts that have lately been made known to us concerning the protection of exotics, may be related as a fit conclusion of this paper. Plants of a particular species, left entirely uncovered, have been less harmed by frost than others of the same kind which were thickly enveloped in close materials ; the difference evidently being due to the additional tenderness acquired by the former from constant seclusion. Others, again, for which no shelter was provided, were conspicuously frozen ; but those of them which happened to be shaded by trees from the direct rays of the sun recovered, while the rest were destroyed. The first of these teaches the impropriety of applying too dense and continuous a covering ; and the lesson to be learned from the latter is that, though the common mode of remedying frost in greenhouses by the instant application of cold water cannot be pursued in the open air, any simple shading which effectively obstructs the sun's rays, will, if thrown over the plant early in the morning, and suffered to remain till a thaw takes place, most probably save the specimen, unless the frost has positively destroyed its tissue.

METHODS OF TRAINING CLIMBING PLANTS.

A large proportion of those who possess only small greenhouses or stoves, and who consequently wish to economise room as much as possible, are constrained to refuse to admit, or to cultivate very sparingly, one of the most elegant of all tribes of plants ;—such as possess climbing habits. The tendency, too, of many of these to extend themselves to a long distance, and to bear ample and spreading foliage, causes them, when trained to the roof of a house, to afford too much shade to the objects growing beneath them, and thus again assists in operating to their exclusion.

Other circumstances which conduce to a like result, are not, however, lacking. The more woody kinds, especially, are notorious for their shyness in the production of flowers; some remaining for several years, and covering an immense superficies, before a single blossom is developed. Connected with this peculiarity, the rapidity of their enlargement may be noted, and the inconvenience they occasion in furnishing suitable borders or boxes for their roots, as well as the difficulty of obtaining access to the latter for the administration of water, and of reaching their branches in order to keep them properly trimmed.

Confining the remarks thus submitted almost entirely to climbers fastened to the rafters of a house, instances are exceedingly numerous in which the reasons assigned actually prevent their cultivation. Whatever mode of management, therefore, be suggested which will set aside those objections, reduce the plants to a moderate size, render their treatment as easy as that of an ordinary shrubby specimen, and impel them to bear flowers sooner and more freely; must unquestionably meet with approbation, and ensure immediate and little less than universal execution. Such a system, already carried out in some places, but even in them not adequately esteemed, and of which the great mass of culturists seem as yet to be completely ignorant, is here to be exhibited.

It consists simply in growing the specimen in pots, like the common, erect, self-supported shrubs of our plant-houses, and training their shoots spirally round a more or less circular trellis affixed to the outside of the pot. By the employment of a plan of this nature, with frequent pruning in particular cases, we have met with climbers clothing a trellis not more than four feet high, and so requiring no larger space than a small shrub; flowering more profusely when merely of three or four years' standing, than if they had been three times that age, and had covered a six-fold greater surface under the usual treatment.

The flowering at so early a stage being the most extraordinary part of this statement, its exciting causes become points well worthy of investigation. To make this inquiry, it will be essential first to make known what are the conditions so inimical to the protrusion of inflorescence which attend the culture generally bestowed. Two classes of these meet our view.

First, the position and quantity of the earth in which the plant is placed have a material and potent influence on its developments. Unless the structure be what is called a conservatory, in which spacious beds or borders of exposed soil form the main features, and which will admit of the climbing plants being placed in them wherever they are required, the prevailing practice is to prepare for them stone, wooden, or slate boxes of earth, or small borders, beneath the stage on which the other shrubs are arranged, and to make those receptacles of a size proportionate to the estimated extension of the roots. A situation so subject to all the droppings of water that drain from the plants above,—so utterly secluded from the rays of the sun and the action of the air,—unavoidably induces a most luxuriant but really unhealthy or unfruitful growth; and however beneficially the upper portions of a plant may be acted upon by the agencies which sustain it in vigour, it is never found to flower or fruit profusely while the water that accumulates and stagnates about its roots is unlimited, particularly if those roots lie beyond the reach of atmospheric action, and in a comparatively unconfined medium. This, then, is one of the incentives to infertility in climbers so circumstanced.

A second matter to which an indisposition to flower may be ascribed, is the purely perpendicular, or partially or thoroughly horizontal, posture in which the stems are trained. A straight-growing shoot of a scandent species can be carried directly to an amazing distance, if its course continue the same year after year; and all its lower parts will in time become destitute of buds, and perfectly bare. But if its natural mode of elongation be diverted, if it be turned in various directions, and, still more strikingly, should it be twisted or bent abruptly from its course, its juices may be made to concentrate in given places, to concoct and put forth buds and lateral branches, and, according to the observed laws of vegetable function, it will flower speedier and with greater prolificness. The unvarying straightness, therefore, with which the stems and branches of climbers are permitted to grow, is another check to the formation of flowers.

Keeping these facts before us, the reasons for the inordinate proliferousness attained under the treatment here advocated, will be immediately obvious. Plants whose roots are confined in pots, and can thus be watered at pleasure,—the soil in which they grow being, moreover, preserved from saturation, and kept in an open and suitable state by the influence of light and air,—while their branches are so curved as to repress extra luxuriance, and present their principal surface more perfectly to the sun,—must, in accordance with all theory, bloom earlier and better; and in practice, the assumption is most fully confirmed.

How far such a method is practicable with species that attain a remarkable length of stem in one year, or eventually reach any extraordinary dimensions, may well be doubted. Still there are numbers which can, with the greatest propriety, be submitted to the foregoing routine, and which will reward the cultivator by constituting some of the most beautiful dwarf objects that it is within the province of art to prepare. Both herbaceous and shrubby species are fit subjects for the operation, and there are only two or three points which need be at all regarded. The quality of the soil is of prime importance, and a sandy, rather than an enriched earth, should be selected. The trellis ought likewise to be secured to the *outside* of the pot, because it can then be more readily replaced by a larger one, should it be requisite, and the roots will not be injured by having the sticks pressing upon them. Pruning may be fearlessly effected where the peculiar habit of the plants seems to demand it, and will always further the final purport of the system. When the shoots gain the top of the trellis, they can very easily be turned back again, and fastened between the ascending ones; leaving, however, the space at the summit quite open, for the admission of the solar rays.

If, in addition to the climbers supported by a trellis, it be thought desirable to have a few still attached to the rafters of the house, in the ordinary way, the reader will perceive the necessity of departing, in some measure, from the plan commonly pursued in regard to the places in which they are planted. Let the tubs assigned to them be on a level with the other pots in the house, or sufficiently elevated to catch the partial influence of the sun, and the passing currents of air; and a condition of vital consequence will have been gained. In training them, however, a great error is mostly committed, by keeping all parts of them too close to the roof, and curtailing, or placing in the direction of the leading stems, the largest of the lateral branches.

This may be, to a certain extent, judicious in a greenhouse, where nothing should interfere with the transmission of light, but for a stove it is utterly unnecessary and unwarrantable. Persons who have seen the long and graceful shoots of various climbers depending from the rafters of a house for ten or fifteen feet, according to its height, laden with their lovely blossoms, and waving gently with the slightest agitation of the air, need not be told that their appearance is the most natural, appropriate, and enchanting, that could by any means be realized. We hope the trim, formal culture of these charming plants, now so general, will be forthwith abandoned, and that not a single specimen will soon be met with which is not permitted to assume a more flowing, elegant, and agreeable form.

It must not be supposed by individuals who happen to have no wall against which they can cultivate climbing plants, that they are compelled to forego the pleasure of growing a few hardy kinds, or even the more exotic species during summer. From what has been said concerning the low trellises to which the greenhouse and stove sorts may be trained, it will be gathered that analogous measures are applicable in the open ground to a limited degree. Any rough and rustic poles will be the best for this purpose, and one, two, three, or more may be employed, as taste or necessity dictates, and either fastened together by small spars, or left detached. They can be made of any desired height, and the stems of the plants should be curved round them pretty closely together. It is essential that a quantity of the smaller external branches be suffered to hang down around the sides, or the aspect of the whole will be too constrained and artificial.

FLORICULTURAL NOTICES.

NEW AND RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MARCH.

ANCHŪSA PETIOLÀTA. An interesting perennial, with handsome blue flowers, and leaves of which the petiole is peculiarly long. It was raised in the Glasgow Botanic Garden from seeds obtained in Nepal by Colonel Colvin, in the service of the Honourable East India Company. Although hitherto treated as a greenhouse plant, it will no doubt thrive in the flower border during the summer months, and add a pretty feature to its common ornaments. *Bot. Mag.* 3858.

BRÁSSIA LAWRENCEÀNA. Mrs. Lawrence, of Ealing Park, succeeded in flowering this showy and very fragrant new species in the month of November last; and Dr. Lindley has appropriately named it after that lady. Its nearest affinity is evidently with *B. Lanceana*, which it resembles in colour, and in the form of the truncated elevation at the base of its lip; but the lateral sepals are said to be much longer than those of that species, and its flowers dry of a bright brown colour, while those of *B. Lanceana* remain pale yellow. It bears a strong spike of flowers, which are of a yellow ground, with reddish brown blotches, the lip being paler, and of only one hue. The species was imported from Brazil, and requires the same treatment as *B. maculata*, and others of its class. The leaves and pseudo-bulbs are not represented, so that we suppose they have no peculiar characteristics. *Bot. Reg.* 18.

CYNOGLÓSSUM GLOCHIDIÀTUM. Exceedingly like the pretty Forget-me-not (*Myosotis palustris*) of our meadows, but with flowers of a somewhat paler blue, and an inclination to grow in a straggling manner. It is a native of the Indian mountains, from whence seeds were sent to the Horticultural Society, by Dr. Royle, and plants blossomed in the conservatory and the open border last autumn. Being a hardy biennial, the seeds may be sown in the open border in May or June, and a rather dry situation seems to suit it best. It will flower from July of the following year until destroyed by frost, or even later in the greenhouse or frame. Its pure sky-blue blossoms render it very attractive. *Bot. Reg.* 15.

HELICHRÝSUM NÍVEUM. A fine Swan River species, said to be an herbaceous perennial, but manifesting a disposition to become sub-shrubby in the greenhouse. It has a particularly robust habit, with stems from three to four feet high, and large white flowers, which are something like those of *H. macranthum*, but want the pinkish tinge which is so apparent in that species. It is a half-hardy plant, flowering beautifully in the open ground, from July throughout the autumn, and retaining its fine everlasting blossoms far into the winter, when removed to a frame. From seeds received by Mr. Low, of Clapton, from Mr. Drummond, it was raised in the Clapton nursery, and specimens sent from thence to the Caledonian Horticultural Gardens. It has flowered in both establishments, as well as in several others. *Bot. Mag.* 3857.

IPOMŒA FICIFÒLIA. Of the native district of this beautiful climber nothing is at present known, though it is thought to be from Buenos Ayres. It was obtained from seeds germinated in the nursery of Messrs. Salter and Wheeler, near Bath, and flowered there in the autumn of last year. The leaves form a ready mark of distinction by being three-lobed, and having their lateral divisions nearly semicircular, resembling those of the common fig. The flowers have a very short tube, and are of a rich purple hue. Its habit is slightly suffruticose, the root tuberous, and its production of flowers, when trained to a cylindrical trellis, quite astonishing. It is not stated what temperature it requires, but it appears to have been kept in a greenhouse. *Bot. Reg.* 13.

SÁLVIA RÈGLA. This splendid new *Salvia* was found by Mr. Hartweg, during his Mexican tours, and sent to the Horticultural Society, in whose garden it bloomed in the autumn of 1840. "It had previously been found by Spanish collectors at Vilalpando, and at a place called Regla, after which the species is named." The wild plant is described as a shrub four or five feet high. It has much the appearance of *S. splendens*, with larger, fewer, deeper red, and more distant flowers, and a peculiarly inflated calyx. Having at present flowered under unfavourable circumstances, it is expected that the blossoms will be more abundant in another season, and the specimens more compact. From the part in which it was discovered it is believed that it will never prove hardy, and as it flowers late in the autumn, it will be altogether more judicious to keep it in the greenhouse. *Bot. Reg.* 14.

SOBRÀLIA SÉSSILIS. A lovely member of the delightful tribe Orchidaceæ, but unfortunately bearing only fugitive flowers. It is a terrestrial species, with slender stems, covered with blackish pubescence, and large, prominently nerved, lily-like leaves. The flowers are terminal, apparently solitary, of a delicate pink hue, with a lip of a somewhat darker shade. They do not expand freely, and decay after having been opened a few hours; though they would probably last longer if placed in a cool and thickly shaded apartment. It has lately bloomed with Messrs. Loddiges, who received it from Mr. Schomburgk. Other species of a far superior character are described, but we doubt whether any of them are yet in British collections. *Bot. Reg.* 17.

SPREKÈLIA GLAÙCA. So great a similarity is there between this plant and the old *Amaryllis formosissimus*, that an ordinary observer would not detect any difference, except in the glaucous foliage and the paler red of the flowers, as well as their smaller size. It was discovered in Mexico by Mr. Hartweg, and forwarded to the gardens of the Horticultural Society, where it expanded its flowers in May, 1840. It is kept, while growing, in a house, the temperature of which is a little above that of the greenhouse, and watered freely. In the autumn, after the leaves have decayed, the bulbs are taken from the pot and placed on a dry shelf, or the soil about them is kept perfectly dry till the following spring. The compost used is a mixture of turfy loam, heath-mould, leaf soil, and sand. *Bot. Reg.* 16.

STÈVIA TRACHELIOÌDES. A very fine herbaceous perennial, with numerous heads of rich, reddish purple flowers, and said to be capable of growing either in the greenhouse or an exposed border. It was raised in the garden of E. Leeds, Esq., near Manchester, from seeds sent there by W. Higson, Esq. of Mexico. In the open border it attains the height of three feet, and as the flowers are borne in great profusion, it is extremely showy. Specimens cultivated in the greenhouse produce paler blossoms, and it seems occasionally to be found with white flowers. The protection of a frame is most likely requisite in winter. *Bot. Mag.* 3856.

NEW PLANTS FLOWERING IN THE SUBURBAN NURSERIES.

Dendròbium Heyneànum. A lovely little species, with cylindrical stems, about four or six inches high, erect, and at present wanting its foliage. The racemes of flowers proceed from near the top of the stems, are slightly drooping, and bear ten or twelve pure white blossoms, which are densely arranged, and have their exterior members so disposed as to look something like a bunch of Syringa flowers. They are rather yellowish in the middle. A specimen is blooming with Messrs. Loddiges.

Lobèlia díscolor. More remarkable for the variegation of its leaves, which contain a most beautiful mixture of purple and green, than for the size or showiness of its flowers; these being dimininutive and white. It is now blossoming in the stove at Mr. Low's, Clapton, and Messrs. Henderson's, Pine-apple Place; but when it is kept in a greenhouse, and flowered at a more congenial season, it will most likely be much superior.

Mirbèlia floribúnda. At first thought to be the *M. speciosa*, and since regarded as a new species by Dr. Lindley. It has narrow leaves, is of a dwarf robust habitude, and produces an amazing number of pretty pale-blue blossoms. Messrs. Loddiges possess a considerable quantity of flowering plants.

Pimèlea spectábilis. An interesting new Swan River plant, raised by Mr. Low, of Clapton, from seeds collected by Mr. Drummond, and lately flowered in the Clapton nursery, as well as in other gardens. It resembles *P. hispida*, though it grows more strongly, and has longer leaves and larger flowers. The latter appear, as usual, in terminal clusters, and are light pink at the base of the tube, becoming darker near the summit.

OPERATIONS FOR APRIL.

Vegetation having commenced its growth with unusual earliness and rapidity, the movements of the cultivator will be proportionately accelerated. It cannot, however, be too strongly pressed on the attention of all engaged in floriculture, that, from the ordinary peculiarities of seasons, a greater or less amount of cold weather must necessarily yet be experienced; and, perhaps, before this is published, the winter, or, at least, some of its attendant rigours, may be freely resumed.

In any case, it behoves every one to exercise the strictest caution; to retard by every practicable means, rather than forward, the progress of plants; and to be prepared with all needful appliances, to shelter valuable species in the open ground, should it be requisite. It is well known that the young newly developed shoots of shrubby specimens are infinitely more susceptive of injury than the more woody and better ripened branches; and it is further manifest, that these earliest developments often contain the rudiments of the ensuing summer's flowers, and sometimes, likewise, those of the following year. Hence, if they are destroyed, the blossoms of one or two years are lost; besides the enfeeblement caused to the entire plant, by reproducing a number of weakly shoots, and the far inferior character of these last.

It can hardly be expected that violent frosts will yet occur to paralyze vegetable efforts; they are, nevertheless, far from being unlikely. But what we seek to induce the reader to provide against, is the cold north-easterly winds, whose effects are frequently called blight. Their action upon exotic plants, in such a spring as the present, would be most disastrous; and its consequences, instead of being comparatively transient, like those on the more common components of our shrubberies, would be seen and felt for several years. Indeed, a very tender plant could scarcely ever recover its natural vigour. We recommend, then, that for the dwarfer kinds, dried fern-leaves and straw, and for the taller sorts, mats or other coverings, be kept in readiness to apply whenever such or similarly cold winds may prevail; and we are certain the culturist will have good reason to congratulate himself on his foresight.

In the more refined departments of culture, a considerable knowledge of physiological principles is necessary, to manage plants properly during the present month. All that have not been potted should be attended to as fast as they exhibit a tendency to grow; and those which do not require shifting into a larger pot, should, notwithstanding, have their roots and the soil about them inspected; for exposure to the numerous changes of a whole year almost inevitably leaves the soil in a condition unfavourable to the future healthy advancement of the specimen. Compactness and imperviousness to water, separation from the sides of the pot, obstruction of the drainage by particles of earth passing down amongst its materials, with other equally undesirable circumstances, may each, or all, need remedying, although the plant should not want a regular repotting.

For the summer treatment of certain dwarf and slow-growing Cactaceæ, we have before strongly advised that fermenting materials be placed beneath them, and a powerful and very moist heat maintained. Where adopted, this system should be brought into operation without delay. From the somewhat similar habits of Orchidaceæ, and from what experience has taught respecting them, we now confidently think that the same method is applicable to them. The only qualification which such a proposition demands, is that, as there are many species which have not hitherto adapted themselves to the principal variations of our climate, and make their new shoots at what, in Europe, is considered an unnatural period, these cannot, of course, be subjected to so generalizing a plan. In the house appropriated to the majority of the more naturalized species, a high temperature, constant atmospheric moisture—and both these augmented, where convenient, by plunging the pots in fermenting bark—with a sufficient shading of thin canvas in the day-time, ought now to be carefully sustained. We have recently seen it stated, by a respectable authority, that Orchidaceæ never thrive in those countries where extremes of heat and cold are not experienced between the day and night, which may serve as a useful hint respecting the inutility of evening fires for the Orchidaceous house.

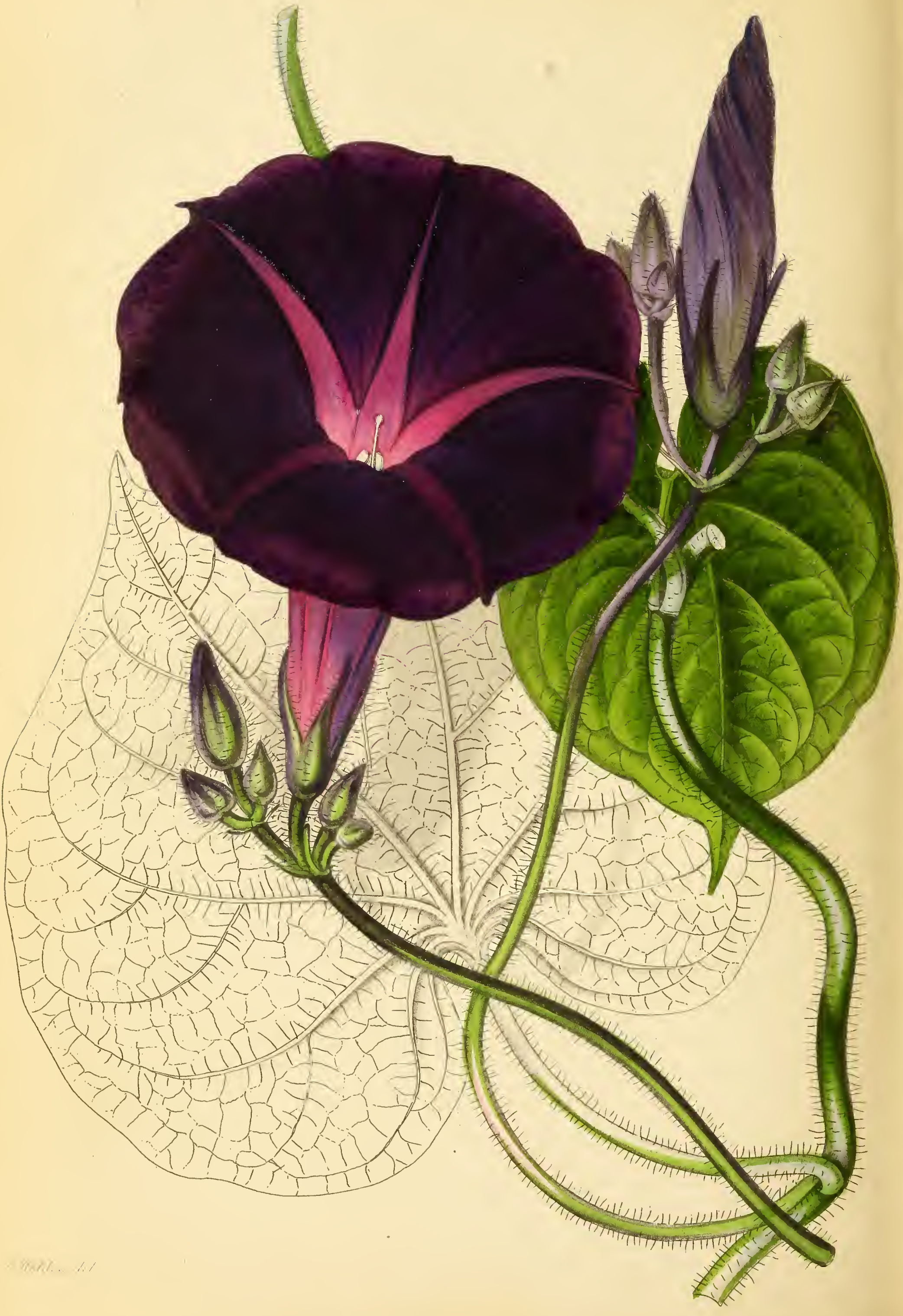
As far as relates to increased humidity or heat, the principles above propounded should regulate the management of the Stove. Tropical plants grow solely at those times when the temperature of the air is excessive, and fluids float most abundantly therein ;—a fact which at once decides the accuracy of the preceding direction.

With reference to greenhouse species, these rules, though appropriate, must be largely modified. It will not do to keep a greenhouse too confined, in order to raise the temperature, since this would at once convert it into a stove. Any course of that kind is, in fact, rendered needless by a remembrance of the simple truth, that in a glass structure, however much air may be admitted, the heat will still remain far above that of the external air. Free ventilation is therefore greatly to be desired, inasmuch as it tends to produce a healthy growth, to moderate the otherwise superfluous heat and evaporation, and render the house more comfortable to the visitor. In providing it, however, it must be seen that hurtful winds are excluded.

To preserve a continuous moistness in the air of the greenhouse will be next to impossible. The best substitute for this is liberal waterings at the root, which will cause constant evaporation, and occasional springings in the evening of fine days, by which the double purpose of supplying moisture and purifying the leaves of plants is answered.

All the plants in pits or frames whose transference to the flower-borders is contemplated next month, may be now gradually acquiring hardihood by being left uncovered with the lights in the day, and also throughout the night, when the weather permits. Some of them will show an early disposition to develop flowers; but the buds are to be timely extracted. In proportion to the extent to which this removal of flower-buds is carried, the summer's display will be either scanty or brilliant.

Annuals may be sown for succession ; Chrysanthemums, Rockets, and all kinds of plants may be propagated from cuttings ; climbers must be trained as they grow ; tender annuals should, if worth it, be potted into small pots, that they may be transplanted with greater facility ; Dahlias and the sorts allied to them in habit are to be hardened ready for planting ; but we would not have the summer ornaments of the flower-beds placed in their final position till the beginning of the succeeding month.



S. Holden del.

Ipomœa tyrianthina.

IPOMŒA TYRIANTHÌNA.

(DEEP PURPLE-FLOWERED IPOMŒA.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
CONVOLVULÀCEÆ.

Generic Character.—*Calyx* of five sepals. *Corolla* campanulate. *Stamens* inclosed. *Style* one. *Stigma* two-lobed; lobes capitate. *Ovary* two-celled; cells two-seeded. *Capsule* two-celled; cells two-seeded.

Specific Character.—*Plant* suffruticose. *Root* tuberous. *Stem* twining, mostly herbaceous, but inclining to be shrubby at the base, having small wart-like tubercles on its surface. *Leaves* entire, nearly round, cordate, acuminate, slightly villous, especially on the veins, and round the margins. *Peduncles* many-flowered, longer than the leaf-stalks. *Corolla* funnel-shaped, deep purple.

So superior is this splendid plant to most of its allies, that Dr. Lindley, who had ample means for observing it, says, in the miscellaneous matter of the Botanical Register for 1838, that "neither *I. rubro-cærulea* nor *I. Horsfalliæ*, nor any other of the noble species which have found their way to Europe of late years, excel it in the richness of its colour, which is of a peculiar tint, resembling nothing so much as the deepest purple ever seen in the finest varieties of *Petunia violacea*."

More recent investigation enables us to state that the above description is not too highly coloured, and that the species deserves to be ranked with the almost inimitable *I. Learii*, as well for the profusion as for the brilliant hue of its blossoms; which, were they equal in size, might perhaps surpass even those of that most valuable climber.

For its first introduction to Britain, Dr. Lindley, in the work before cited, mentions that our cultivators are indebted to George Frederick Dickson, Esq., by whom the seeds were received from Mexico, and given to the Horticultural Society; in whose garden it shortly afterwards flowered. But the specimen from which our drawing was executed was imported by Mr. John Henchman, nurseryman, of Edmonton, among some Cacti, in June 1840. Mr. Henchman having obligingly favoured us with its history and culture, we shall here detail them.

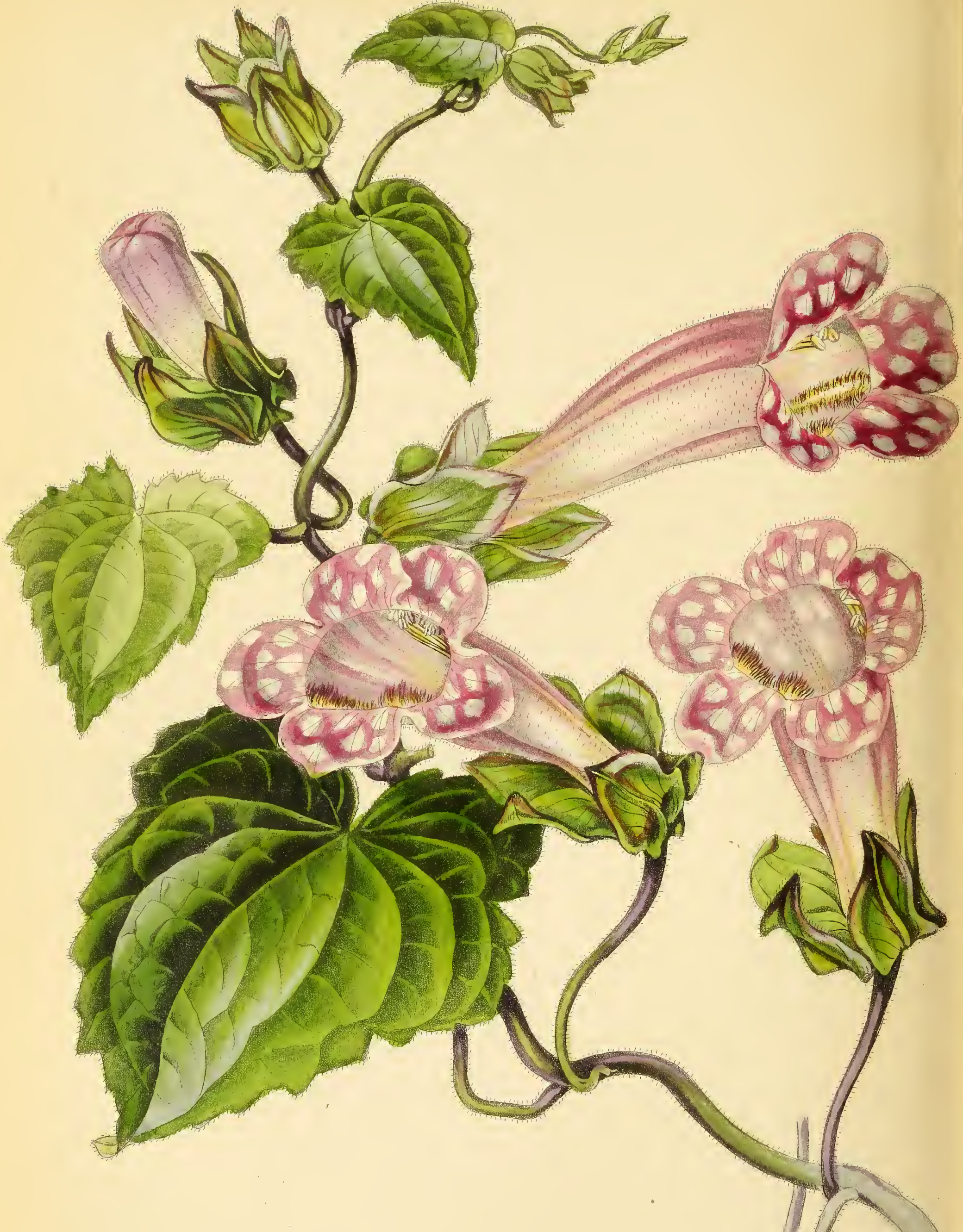
It was collected by a friend in the vicinity of Real del Monte; and the roots, which Mr. H. describes as resembling a large mangold-wurzel, were potted immediately after their arrival, and "put in a little heat, where, in a few days, they began to push out several young shoots from the crown. They were then repotted into some good, rich soil, and well supplied with water; and when rooted, their growth was amazingly rapid, the strong shoots often growing from two to three inches in twenty-four hours; so that by the end of August they were large plants, and full of bloom. The plants continued in flower till November, when they gradually died down. The flowers, which are very numerous, and produced in clusters on long footstalks, continue open two days, except in very hot weather; but by the second day their fine rich hue has disappeared, leaving the ground colour a reddish purple."

Mr. Henchman's plants were repotted in February of the present year, in a compost of rich loam, well-rotted dung, and a little sand; and they are now again large specimens, promising to blossom most abundantly by the middle of May.

Till they commence flowering, they are kept in a gentle heat, and were last season removed to the greenhouse when they began to bloom, in which situation their flowers were fully perfected. This treatment appears very suitable both for the present and all allied kinds; as they flower too late if kept always in the greenhouse, and their colours are not so vivid when grown constantly in the stove.

Cuttings of the young shoots will most probably root with freedom; and they should be taken off in the early part of the year, to enable them to form fine roots before the winter. Indeed, the system of propagation usually followed with Dahlias is precisely adapted to this plant.

Ipomœa is taken from *ips*, bindweed, and *homoios*, like; because the plants are very nearly related to *Convolvulus*. The specific appellation has reference, we presume, to the colour of the flowers, which is considered equal to the widely-celebrated purples of ancient Tyre.



S. Holden del.

Lophospermum erubescens spectabile.

LOPHOSPÉRMUM ERUBÉSCENS; *var.* SPECTÁBILE.

(SHOWY REDDISH-FLOWERED LOPHOSPERMUM.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMA.

NATURAL ORDER.
SCROPHULARIÀCEÆ.

GENERIC CHARACTER.—*Calyx* five-parted; segments large, ovate-lanceolate, with a quincuncial æstivation. *Corolla* bilabiate, tubular; tube campanulate, a little curved, contracted above the base, elongated, gibbous, forward at the base, dilated at the throat, and furnished with two rows of interwoven yellow hairs; upper lip almost erect; lower lip spreading. *Stamens* four, didynamous. *Seeds* very numerous, ovate-truncate, tubercled, black, fixed to large placentæ.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* subshrubby, evergreen. *Stems* climbing; branches covered with short, jointed, viscid hairs. *Leaves* partially cordate, imperfectly five-lobed, downy; lobes mucronate, notched at the margin. *Flowers* rosy-pink.

Var. SPECTABILE.—*Flowers* with many large and distinct spots of white.

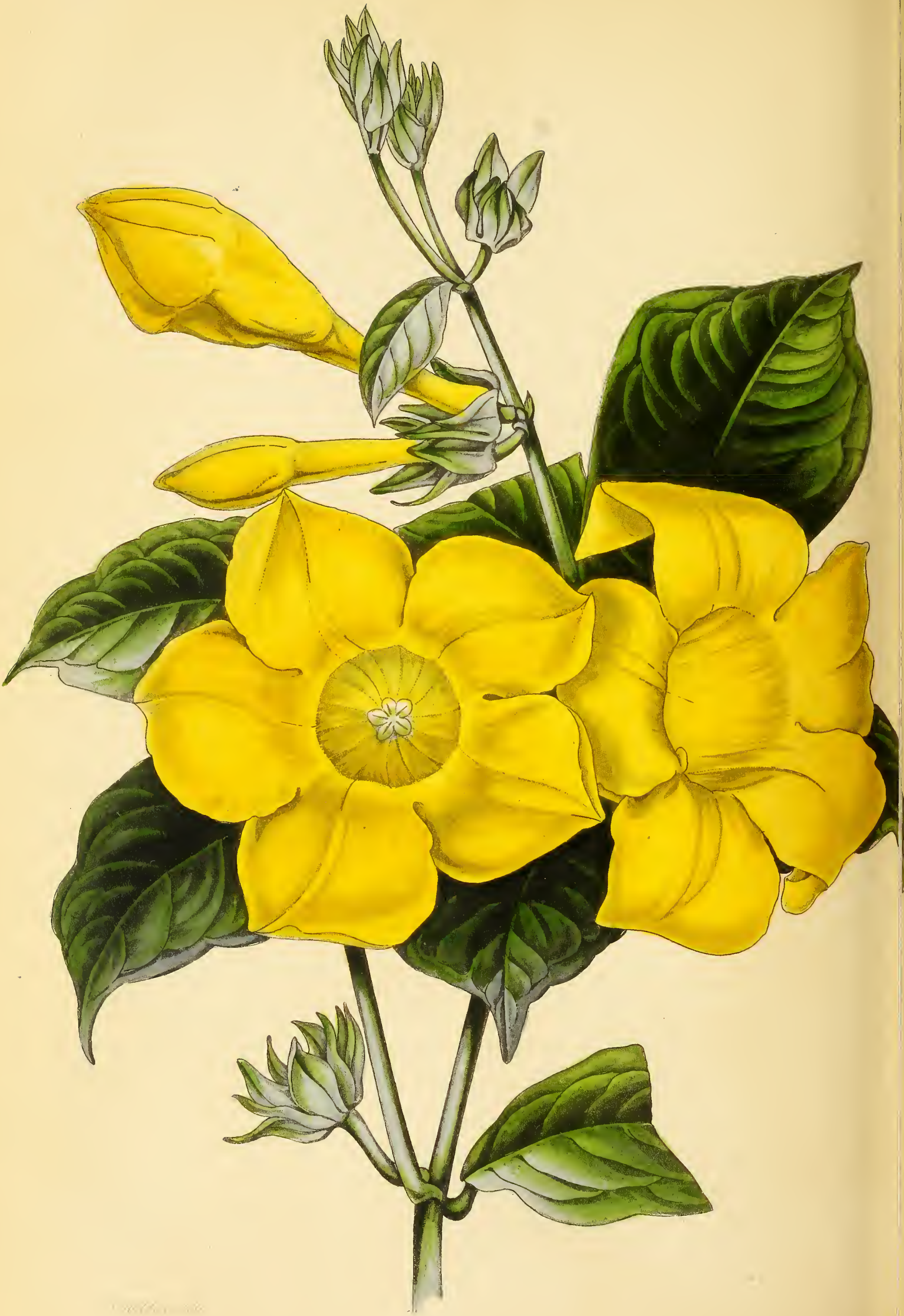
THIS is a lovely variety of a plant known to all admirers of flowers, and almost as universally grown. From its peculiar beauty, and the exceedingly delicate and interesting spottings of its charming flowers, we have thought it worthy both to grace our pages, and to embellish the greenhouses or flower-gardens of British culturists.

In its origin, it affords a striking proof of the advantages likely to result from the more general propagation of our commonest garden ornaments by seeds; being simply a seedling, accidentally raised, as we believe, and without any artificial impregnation, from seeds of *L. erubescens.* The credit of originating so pleasing a variation from the old species is due to Mr. T. Ansell, of the Camden Nursery, Camden Town, by whom it was obtained in the year 1838, but did not flower till the following season. On account of its profuse production of flowers, and their prettily mottled character, Mr. Ansell gave it the name with which it is here published; and informs us, that as the stock of it was nearly lost in the winter of 1839, it is by no means yet abundant. We first saw it at Messrs. Henderson's, Pine-apple Place, in the summer of 1839; and with a better specimen which flowered at the same establishment in 1840, we were so delighted as to have the accompanying figure taken.

Being only a seedling, and necessarily of a similar nature to *L. erubescens*, it is of course applicable to the same purposes. We are inclined to believe, however, that if plants of it were placed in the open ground during summer, the blossoms would, by exposure to direct solar agency, be deprived of some of that purity and delicacy both of the ground tint and the spots for which they are so conspicuous, and consequently suffer in the estimation of the grower. It would be better, therefore, we think, to preserve it in the greenhouse, in a pot of loamy soil, and train it to a cylindrical trellis, on which its flowers will be more easily displayed than if it were fastened to the rafters of the house.

Propagation can be readily effected by cuttings, which root with the greatest facility. It is extremely doubtful if it could be perpetuated by seeds; and whether the seed of *L. erubescens* would often produce a sort of this kind, we are by no means prepared to determine. At any rate, it deserves trial. Young plants ought to be reared annually to displace the old ones, which are apt to become bare and barren at the bottom.

Lophos, a crest, and *sperma*, a seed, constitute the basis of the generic title, as the seed is furnished with a crest-like wing.



Allamanda cathartica.

ALLAMÁNDA CATHÁRTICA.

(CATHARTIC ALLAMANDA.)

CLASS.	ORDER.
PENTANDRIA.	MONOGYNIA.

NATURAL ORDER.

APOCYNÀCEÆ.

GENERIC CHARACTER.—*Calyx* five-parted; segments lanceolate-oblong, acute. *Corolla* funnel-shaped; with a narrow tube, and a swollen, large, inflated limb, which is five-cleft at the apex; furnished with five scales in the throat of the tube, which cover the anthers. *Anthers* five, almost sessile, converging. *Style* one. *Stigma* capitate, contracted in the middle, adhering to the anthers. *Capsule* echinated, roundish-elliptic, one-celled, two-valved, many-seeded. *Seeds* surrounded by a membranous edge, fixed to the edge of the valves. *Albumen* wanting.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* shrubby, evergreen. *Stem* erect, climbing. *Leaves* usually four in a whorl, sessile, oblong, acuminate, smooth and shining on the upper side. *Flowers* large, yellow, growing in clusters at the sides of the young shoots. *Calyx* with unequal segments. *Germen* nearly globular, furrowed at the base. *Style* filiform, the length of the tube of the corolla.

PROBABLY no old stove-plant is more affected by appropriate or improper treatment than the fine species of which a drawing is now published. At Messrs. Henderson's, Pine-apple Place, we observed it last year growing with such great luxuriance, and flowering in such high perfection, that we were led to disregard its oldness, and bring it thus prominently forward in order to induce others to give it the same simple attention.

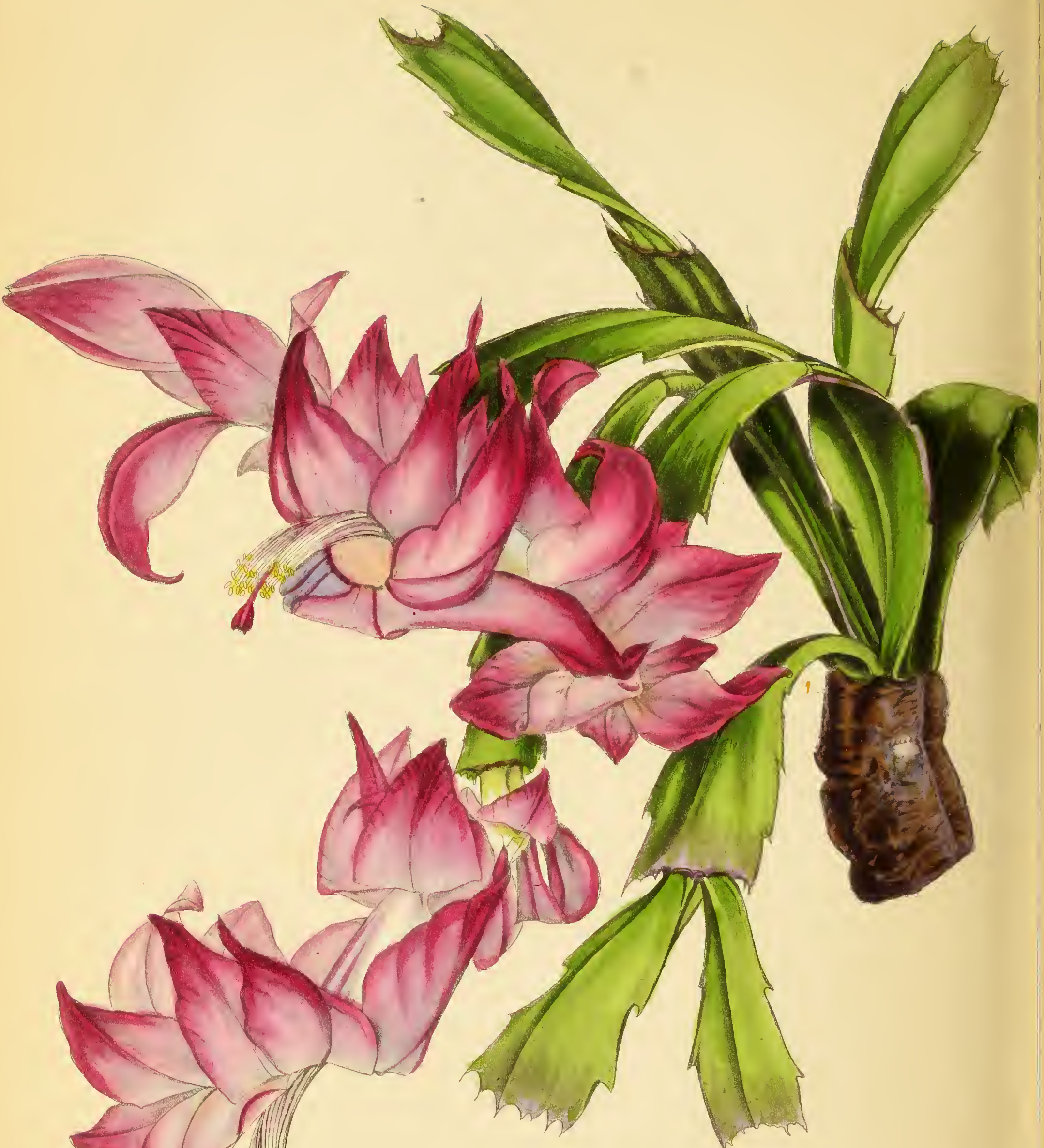
Its native country is Cayenne and Guiana, where it is reported to flourish in the neighbourhood of rivers. Baron Hake is said to have introduced it in the year 1785; but its cultivation has been renewed within the last six or seven years with greater spirit than before, and it may generally be found in the best collections, notwithstanding the length of time it has been known.

As a stove-climber, it must be regarded as of a very ornamental character. Its leaves are large, handsome, of a deep glossy green, and retained all the winter; while they are not, as in some climbing plants, so remote as to suffer the eye to rest long on the bare stems; and the species is of a particularly free and strong growth when judiciously managed. The flowers, too, are exceedingly showy; and although their colour be yellow, which is not commonly admired, it is of that peculiarly rich shade of which none can do otherwise than approve. We should note, however, that unless this plant is favoured with suitable culture, it becomes a straggling and almost disagreeable object, the beauty of its noble flowers being insufficient to atone for a want of good foliage and general health.

The principal things to be thought of in its cultivation, are to provide a spot in which it can be planted out where the sun and air may act on the soil, and to be careful in keeping this so far above the level of the floor of the house, and so thoroughly drained, that it may never be unnecessarily drenched with water. A rich loamy soil, to which a little heath-mould can be added, is a proper medium for the roots; the species requiring a rather more nutritive earth than many plants of its class, from the unusual vigour of its growth. A tolerably high temperature and a moist atmosphere are essential to its full development in summer; and a place in an Orchidaceous-house, where these conditions are secured, and where the *Allamanda* will assist in forming a natural screen to the roof, is most desirable. So treated, it will flower during the whole of the late summer and autumnal months.

It is easily increased by cuttings of the younger shoots, which can be prepared at the most convenient period, and planted in the ordinary way, beneath a shaded glass, in a warm propagation-house or frame.

The genus commemorates Frederick Allamand, a surgeon of Holme, who travelled in Guiana about 1769, and probably discovered the plant that bears his name.



Epiphyllum truncatum violaceum.

EPIPHỲLLUM TRUNCÀTUM; *var.* VIOLÀCEUM.

(VIOLACEOUS-FLOWERED TRUNCATED-STEMMED EPIPHYLLUM.)

CLASS.
ICOSANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
CACTÀCEÆ.

Generic Character.—*Sepals* imbricated, numerous, confounded with the corolla. *Corolla* indefinite. *Branches* leaf-like, fleshy, usually smooth, but sometimes having a few spines on their margin; each with a midrib and diverging side veins, which terminate at the indentations on the edges. *Flowers* issuing from the extremities of the midrib or side veins. *Stamens* numerous.

Specific Character.—*Plant* shrubby, dwarf. *Stems* short, flattish, becoming rough when old; branches jointed, divaricated, compressed like a leaf, contracted at the base, with a few scattered serratures on each side, crescent-shaped at the summit. *Flowers* whitish at the lower part, rosy-red above, terminal, sessile, solitary, drooping; petals imbricated, reflexed, spreading widely. *Stamens* numerous, bundled, partly ascending, the length of the petals. *Stigmas* many, of a deep blood-colour.

Var. Violaceum.—*Flowers* having the tube and the base of the petals pure white, with the upper portions and the stigma and style tinged with a purplish hue.

Of the many divisions into which the old genus *Cactus* was separated, there is none more natural or more readily recognised than that to which the title of *Epiphyllum* has been applied. This comprehends the well-known *C. speciosus* of early authors, the characteristics of which distinguish all the rest. They are flat, expansive, leaf-like branches, along the edges, and at the extremity of which the flowers are produced.

Beautiful as is *E. speciosum*, however, and deserving as it undoubtedly is of the high favour it has gained, it must at once give way when brought into comparison with *E. truncatum*. The dwarf habitude of this latter, its gracefully half-drooping branches, the singular form, interesting disposition, and admirable tints of its flowers, with their development in the depth of winter, when most succulents are enjoying complete repose, render it an invaluable acquisition to any garden. And if the lovely hues of its blossoms are admitted as one of its principal attractions, the variety here first figured must stand pre-eminent in that particular.

It is totally impossible to exhibit on paper any combination of colours, of which white forms a part, the darker shades merging gradually into this till it becomes stainless. In the flowers of the plant under notice, the whole of the tube and the base of the petals is literally a snowy white, while a band of a vivid purplish hue extends down the sides of the latter, and round the orifice of the tube; the upper portion of the petals being of a most indescribably pleasing purplish tint. When flowering in company with the original species, the difference of colour is clearly apparent, and the contrast extremely agreeable; but *E. truncatum* decidedly loses its supremacy by the comparison. A close examination of several specimens of both sorts will show a further trifling distinction of somewhat rounder stems, narrower branches, with less truncate extremities, and more spinous clusters, in the present variety; though these peculiarities are not strongly apparent.

In the culture of *E. truncatum*, it is customary to graft it on stocks of *Pereskia*, or some strong-growing *Cereus*. Except for the sake of curiosity, this is not a plan which can be much recommended, as the plants are so liable to get broken or injured near their junction, and large specimens are often lost in that way. The best plan of management is to grow them on their own roots, when, by their lowness and partial pendulousness, they are singularly suitable for placing on the shelves of the stove, or planting in baskets or pots suspended from the roof. They must either be potted in a light porous soil, or in sphagnum moss, through which water will drain freely, not being able to endure much moisture. They may be repotted yearly, if requisite, shortly after flowering, and kept in a damp stove till their growth is completed, when they can be transferred to a dry succulent house. At all times an abundant access of light to them is requisite.

Cuttings, severed at a joint, should be allowed to shrivel a little before being planted, or otherwise kept out of the reach of excessive moisture afterwards.

Epiphyllum is derived from *epi*, upon, and *phyllon*, a leaf, in allusion to the protrusion of the flowers from the margins of the leaf-like shoots. The word *truncatum* refers to the abruptly-broken appearance of the ends of the branches; and *violaceum*, applied to this variety by Dr. Lindley, expresses the violaceous tints of the flowers. It has before been described by us under the name of *E. purpurascens;* the colour in the specimens we have seen being better indicated by that term.

Messrs. Rollison, of Tooting, from whose nursery our figure was prepared in January last, imported plants of it from Brazil several years back; and it has likewise been procured from the same quarter by other individuals.

OF GARDENING AS A SCIENCE.

NO. IV.

In following up the subject which we commenced in the last number, p. 55, it will be requisite to enter somewhat at large upon the investigation of that substance which, under the name of *humus*, has recently engrossed much of the attention of agricultural writers: gardeners, however, have said little about it, though, if it be the nutritive principle of vegetation, they are as much concerned in it, if not more so, than is the farmer. About ten years since, the reading public became interested by the importance which was attached to a certain matter in the soil, which had suddenly assumed the title of *humine*: this word went its round, till at length discovery was made that pearl-ash and soda, as well as lime, exerted a peculiar action upon it; and then the term *humic acid* came into vogue. Now, however, the same substance has acquired the more simple term of *humus*, a Latin word, which means the soil or ground, or, in its new acceptation, the fertilizing principle of the soil. We will not quarrel with terms, for "what is in a name?" but content ourselves by showing, from Dr. Liebig's plain recital of facts, that authors and readers are pretty nearly in the same predicament, and understand little of the philosophy of their fashionable subject.—Thus, at p. 4 *et seq.* of "Organic Chemistry," we find that—

"*Humus* is described by chemists as a brown substance, easily soluble in alkalies, but only slightly soluble in water, and procured by the decomposition of vegetable matters by the action of acids or alkalies. It has, however, received various names, according to the different external characters and chemical properties which it presents. Thus *ulmin*, *humic acid*, *coal of humus*, and *humin*, are names applied to modifications of *humus*. They are obtained by treating peat, woody fibre, soot, or brown coal with alkalies; by decomposing sugar, starch, or sugar-of-milk by means of acids; or by exposing alkaline solutions of tannic and gallic acids to the action of air."

The reader should bear in mind that the substances thus alluded to, are pure results of experiments in the laboratory: by a grasping after novelty, an assumption of the air of science, or by a sort of mental obliquity, modern agricultural teachers have assumed that their *humine* or *humus* is identical with the humus of the chemist; whereas,—"Not the slightest ground exists for the belief that one or other of these artificial products of the decomposition of vegetable matter exists in nature in the form, and endowed with the properties, of the vegetable constituents of mould; there is not the shadow of a proof that one of them exerts any influence on the growth of plants, either in the way of nourishment or otherwise."

In other words, writers have identified the matter of "earth laborated manure" with the artificial humus of chemistry; and observing a scantiness of growth where there was a known deficiency of such manure, they found proof conclusive of the fact, that *humus* was the nutrimental matter of vegetation. "Yet, this position, when submitted to a strict examination, is found to be untenable; and it becomes evident, from most conclusive proofs, that *humus*, in the form in which it exists in the soil, does not yield the smallest nourishment to plants." *Humus*, dissolved in the water of the soil, is supposed to be conveyed through the roots; but *is* humus soluble—can it be so dissolved? We will first produce the opinion of Liebig, and then, at the first opportunity, add a few remarks, to a certain extent theoretical, but which will tend to reconcile conflicting opinions; and being based upon the induction of facts, will, in a degree, interpret the phenomena of manure and exhaustion.

First, then:—"*Humic acid*, when first precipitated, is a flocculent substance, is soluble in 2500 times its weight of water, and combines with alkalies, lime, and magnesia, forming compounds of the same degree of solubility (Sprengel). Vegetable physiologists agree in the supposition that, by the aid of water, *humus* is rendered capable of being absorbed by the roots of plants. But according to the observation of chemists, humic acid is soluble only when newly precipitated, and becomes completely insoluble when dried in the air, or when exposed in the moist state to the freezing temperature. (Sprengel.)

"Both the cold of winter and the heat of summer, therefore, are destructive of the solubility of humic acid, and, at the same time, of its capability of being assimilated by plants. So that, if it is absorbed by plants, it must be in some altered form.

"The correctness of these observations is easily demonstrated by treating a portion of good mould with cold water. The fluid remains colourless, and is found to have dissolved less than 100,000th part of its weight of organic matter, and to contain merely the salts which are present in rain-water."

Physiologists have observed this insolubility, and, therefore, have assumed that lime, or some vegetable alkali, acts as the solvent: and here we request the particular attention of the reader to the mode of reasoning by which our author overthrows this position. By a peculiar tact, he brings massive facts to bear upon a theory which he deems erroneous; and herein consists much of the power of his work. He admits that "alkalies and earths do exist in the different kinds of soil in sufficient quantity to form such soluble compounds with humic acid. Now," he adds, "let us suppose that humic acid is absorbed by plants in the form of that salt which contains the largest proportion of humic acid, namely, in the form of humate of lime, and then, from the known quantity of the alkaline bases contained in the ashes of plants, let us calculate the amount of humic acid which might be assimilated in this manner.—40,000 square feet, Hessian measure, of wood-land, yield annually, according to Dr. Heyer, on an average, 2650 lbs. Hessian of dry fir-wood, which contain $5\frac{6}{10}$ lbs. Hessian of metallic oxides."

Here, be it borne in mind, that dry wood is composed mainly of woody fibre, which, when reduced to charcoal by slow combustion, retains the precise figure, lines, and tracings of that fibre. Now, the basis of humus, or decaying vegetable matter, is woody fibre, reduced by a still slower process of combustion, (that is, by decay,) to which Liebig has adapted the very expressive term of *Eremacausis*.

By metallic oxides we understand, chiefly, the alkalies called pearl-ash and lime, products of the metals *potassium* and *calcium ;* though the small quantity of iron traceable in wood ashes is also included. " Now, according to the estimates of Malaguti and Sprengel, 1 lb. Hessian of lime combines chemically with $10\frac{}{10}$ lbs., Hessian, of humic acid; $5\frac{6}{10}$ lbs. of the metallic oxides would accordingly introduce into the trees 61 lbs. Hessian of humic acid, which, admitting humic acid to contain 58 per cent. of carbon, would correspond to 91 lbs. Hessian of dry wood." But we have seen that 2650 lbs. of fir wood are really produced! Again, according to the same data—

" It will be found that the wheat growing on 40,000 square feet of land would receive, in that way, $57\frac{1}{2}$ lbs. Hessian of humic acid, corresponding to 85 lbs. Hessian of woody fibre. But the extent of land just mentioned produces, independently of the roots and grain, 1780 lbs. Hessian of straw."

He next proceeds to calculate the utmost quantity of humus which plants could take up by the solvent power of rain-water, independently of any chemical agency: thus—

" The quantity of rain which falls at Erfurt, one of the most fertile districts of Germany, during the months of April, May, June, and July, is stated by Schubler to be $17\frac{1}{2}$ lbs. Hessian over every square foot; 40,000 square feet consequently receive 700,000 lbs. Hessian of rain water. Suppose that not a pound of this water evaporates, except from the leaves of the plants, and, if we further assume, that the water thus absorbed is saturated with humate of lime; then the plants thus nourished would not receive more than 300 lbs. Hessian of humic acid, since one part of humate of lime requires 2,500 parts of water for solution. But since it is known that only a small portion of the rain water, which falls upon the surface of the earth, evaporates through plants, the quantity of carbon which can be conveyed into them in any conceivable manner, by means of humic acid, must be extremely trifling in comparison with that actually produced in vegetation. Other considerations, of a higher nature, confute the common view respecting the nutritive office of humic acid, in a manner so clear and conclusive, that it is difficult to conceive how it could have been so generally adopted."

He then states the calculation of various products from fertile land—trees, beet-root, rye, hay, and the like; from which, as facts incontestable, he infers " that equal surfaces of cultivated land, of an average fertility, produce equal quantities of carbon;" and adds—"yet how unlike have been the different conditions of the growth of the plants from which this has been deduced !"

But the soil, instead of becoming exhausted of humus, "*becomes every year richer* in this element. A certain quantity of carbon is taken every year from the forest or meadow, in the form of wood or hay, and in spite of this, the quantity of carbon in the soil augments; it becomes richer in humus."

But carbon, in the form of woody fibre chiefly, and secondarily, as a constituent of every vegetable organic product, is obtained from some source or other; and in conducting inquiry to trace that source, the writer displays much acumen, and power of original thought: for example, p. 16—

The Origin of Carbon in plants is intimately connected with that of the origin of humus. "It is universally admitted that humus arises from the decay of plants. No primitive humus, therefore, can have existed; for plants must have preceded the humus. Now, whence did the first vegetables derive their carbon? and in what form is the carbon contained in the atmosphere? The answer to the last query is plain and definite—that it does, and can exist, only in the condition of carbonic acid; a gas which, a few years past, was called *fixed air*, or aërial acid.

"It is quite evident that the quantities of carbonic acid and oxygen in the atmosphere, which remain unchanged by lapse of time, must stand in some fixed relation to one another; a cause must exist, which prevents the increase of carbonic acid, by removing that which is constantly forming; and there must be some means of replacing the oxygen, which is removed from the air by the processes of combustion and putrefaction, as well as by the respiration of animals. Both these causes are united in the process of vegetable life!" (p. 18.)

Here we quit our author till our next article, when we hope to adduce his authority, confirming our own observations, in proof that plants must derive their woody fibre from the atmosphere.

Thus generalising now, we reserve our remarks on *garden humus*, as distinct from chemical humic acid, to another month. In the mean time, we suggest that the gardener may find his purest type of humus in the brown and black decayed vegetable matter of the earth; first called 'bog-earth,' then *peat*, but more correctly, 'heath' or 'moor soil.'

We have heard of ferruginous bog, and that such a material is destructive of the fine hairy-rooted tribes. All soils contain some iron, and possibly, where the heath soil of a district approaches to true peat, and is digged from a bog, the iron may exist *as a salt;* when, assuredly, it will be insalubrious. We have before us three analysed specimens of heath mould; two from Wimbledon common, and one from Bagshot. One of the former was brown, fibrous, and light; 15 grains lost at a red heat 5 grains, leaving 10 grains of dingy sand: the other weighed 26 grains; it was of a pale grey colour, very loose, and left 23 grains of sand. Bagshot soil, deep blackish grey, lost 4 grains of 24: the sand of all, digested in weak sulphuric acid, yielded a colourless solution, till a drop of prussiate of potash was applied; when the fluid assumed an intense blue tint, owing to the separation of prussian blue. This iron, not amounting to $\frac{1}{30}$ of the whole, can do no injury to any of the heath tribes; but every trial furnishes new evidence of the great variation of soils, both as respects their chemical constituents and texture. Our limits are attained, and we must defer other important remarks, which we had hoped to offer at this time.

TENDER PLANTS THAT WILL THRIVE IN A SHELTERED BORDER.

THAT there are multitudes of plants to which old-fashioned cultivators continue to assign a position in the stove or greenhouse, but which have been demonstrated by the more enterprising and experimental to require only a proper situation and partial shelter to induce them to succeed in the open air, has frequently been asserted in this magazine; and in the commencing number of the present volume, an article was devoted to a description of the kind of border and protection which such objects require. Referring to that paper for all necessary information as to the principles of procedure, we shall now name a few of the species which we have seen flourish in those circumstances; adverting, where needful, to the peculiar attention they demand, and confining ourselves solely to the most ornamental kinds.

Allowing the first place to a plant whose extraordinary merit, rather than the novelty of any communication we have to make concerning it, entitles it to the earliest notice, we have to introduce *Erythrina crista-galli.* Several years ago, and in various publications, it has been stated vaguely that this splendid exotic might be grown in a protected border; but as far as we have observed, the hint has rarely been acted upon. Indeed it is common to meet with it in stoves, where we would still have a plant or two kept for its showy flowers, though very seldom does it adorn the bed of the conservatory; and those who have no protective structure in which to grow it, or only a small greenhouse, scarcely seem aware that there is such a plant in existence, much less that it can be cultivated in their own border, and will there attain a far higher perfection than if it were beneath glass.

The specimens of this plant that have at different times presented themselves to our view in the borders before plant-houses, have always impressed us with the desirability of extending its out-door cultivation; yet, with none have we been so much struck as with a noble one that has been planted for years in the border fronting the greenhouses at Lady Tankerville's villa, Walton-on-Thames; and which, last year, bore stems, leaves, and flowers fully three times as large as those of plants nursed in a stove, the appearance of the whole being very imposing, and the colours of both blossoms and foliage peculiarly rich.

For the plant in question, no other covering is furnished in winter than a thin layer of light litter, and a little exhausted bark would answer the same end equally well. Of the ease, therefore, with which it may be managed, nothing further need be said. Each year's stems decay, or exhibit a tendency to decay naturally in the autumn, after the flowers are shed, when they can be cut down to within two or three inches of the base, and new ones will be produced in the ensuing spring. We urgently press this superb species on the attention of amateurs and the proprietors of small villas, as in it they may, without any expense for artificial heat, grow one of the finest exotics to a degree of splendour which persons of the amplest means can only rival by similar treatment. For all classes, in short, and for every pleasure-garden in which a suitable border exists, it is an inestimable ornament.

Eucomis punctata is the next plant on which we have a few remarks to offer. It is sometimes, but not often, admitted permanently to a stove; and a greenhouse, or frame, is, we believe, almost invariably considered indispensable for its conservation. In these situations, it is valued chiefly for its neatly spotted leaves, and the astonishing profusion and duration of its blossoms, which are not in themselves particularly interesting, being of a greenish ground, with a few small purple blotches. About the month of October, 1839, chancing to call at Bury Hill, the residence of R. Barclay, Esq., near Dorking, we saw an enormous specimen of this species in a border of the description referred to throughout the present paper, and it had then numerous spikes of flowers, which had been expanded for a considerable previous period. The remarkable exuberance, health, and beauty of the specimen, gave us quite a new idea of the species altogether, and impressed us with the conviction, to which we still avow our adherence, that it is one of the handsomest summer and autumn plants which have ever decorated our borders. The absence of much colour in the flowers may appear like a defect to those who are fond of a great glare of gorgeous hues; but, if duly associated with plants of that character, its modest and simple charms will afford a relief rather than an objection. As with the *Erythrina* above mentioned, it has no protection through the winter save a mulching of some dry material, and flowers, year after year, with increasing vigour.

At the same place, the pretty species of *Nerine* are grown in a like manner, and there is no occasion to renew them annually by importations from the Channel Islands, as in the majority of cases. They grow strongly, and flower in the greatest beauty, giving a very lively aspect to the border when they are all in blossom. It will be prudent to mix a little more sand with the soil in which they are planted than is demanded for fibrous-rooted herbaceous plants or shrubs, lest there should be any difficulty in causing their foliage to wither at the proper season.

Four or five years since, a plant appeared in the London nurseries, and in common with many other Mexican and South American species, the district from which it was brought not being correctly known, it was judged advisable to keep it in the stove. This was *Mentzelia stipitata.* It developed sparingly its interesting orange-coloured flowers, and seemed decidedly shrubby; but always looked sickly, and neither grew freely nor bloomed well. Since that time, it has been tried in the open border, and constitutes a singularly neat and healthy bush during summer, bearing great numbers of flowers throughout the entire season. If placed in the sort of border which we all along have in view, we believe it will assume the habit heretofore ascribed to *Erythrina*, losing its stems in the autumn, to be replaced on the advancement of spring. The smallest shelter, of the kind already suggested for *Erythrina*, will suffice to preserve it from frost. It deserves to be cultivated for the profusion of its pale-orange flowers, which are somewhat larger than a shilling.

Lilium eximium is one of the admirable species introduced by Dr. Siebold from Japan, and nothing can be more fitted for growing in a warm border. It is a dwarf plant, not rising higher than two feet, with a rigid upright stem, large leaves, and flowers which resemble those of *L. longiflorum*, but are more expansive, and altogether of greater dimensions. It is one of the best of all lilies, surpassed merely by the more richly-coloured species; while its flowers are of as pure a white as the favourite kind so abundant in gardens. Having been flowered most beautifully in a border at the Epsom nursery, there can be no doubt of its sufficient hardihood to stand in one which is well backed by plant-erections; the sole condition to be guarded against in winter being superfluous or stagnant water about its bulbs. *L. longiflorum* is hardly inferior, as the habit is quite as dwarf, and the blooms are very long, and of a clear white. It is no less adapted to the object under reference than the species of which we have just spoken.

L. speciosum, and its charming varieties, would, if capable of thriving out of doors at all, assuredly succeed in the borders of which we treat. Coming from the same country as *L. eximium*, we can perceive no other reason why they should not be as hardy, than that their powers of endurance have not yet been put to the proof. Since, if covered with a spacious flower-pot, inverted and filled with dry litter, they could not possibly be damaged, and as young plants can be obtained in any quantity from the scales, we do hope that some one near London, or in the more southern counties, will try the hardihood of these delightful plants in the current season; for which end, they should be immediately planted out. The capacity of *L. Thunbergianum*, likewise from Japan, has, on trial, been shown to be adequate for its security in ordinary winters; and besides adding another valuable species to the select list we are supplying, it confirms the probability of *L. speciosum* being robust enough at least for the adoption of the test.

There are few sorts of *Alstrœmeria*, from the commonest to the most rare, that would not succeed in a well-sheltered border. Many will even flourish upon a level and wholly exposed plot; but their slightly-succulent nature renders great caution necessary in preventing moisture from accumulating around them, and a raised border is most effectual for this. *A. Hookeri*, *Neillii*, *psittacina*, *pulchella*, and *aurantiaca*, are, we know, perfectly able to bear our winters in a dry situation, with a little shelter. And both *A. acutifolia* and *A. hirtella*, climbing species, may be grown in the border with complete impunity. The former requires to be trained to the wall, or to a tall pole; while the latter does not usually grow above three feet high, and may be supported by an ordinary pea-stake. The difference which *A. acutifolia* displays when turned out into a free soil is amazing, and we have seen plants of it at Bury Hill, where Mr. Scott cultivates *Alstrœmerias* very skilfully, which were truly magnificent. All of them prefer an enriched soil.

Epimediums, too, would be lovely plants in a conspicuous border. *E. macran-*

thum, *violaceum*, and *Musschianum*, are all most elegant little border flowers, and quite hardy enough for the situation intended. In fact, they will grow in any part of the open ground; and we have lately marked the beautiful *E. violaceum* entirely covered with blossoms, although the plants had not the least attention during the past severe winter. If they will exist, however, in a flat plot, they will constitute most engaging objects when placed in a prepared border, and their sweet blossoms will attain nearly double the size, with a far greater degree of delicacy, under so congenial a system of culture.

Again, the finest varieties of *Mimulus cardinalis*, with the many handsome hybrids that have been raised between it and the humbler kinds, acquire a compactness and a robustness in an appropriate border, which is unknown to the more artificial cultivator; and anything that will protect them from extreme wet or the most violent frosts, is amply sufficient to enable them to dispense with greenhouse treatment. The true *M. cardinalis* may thus be multiplied by offsets, which it produces most abundantly, and the more tedious process of rearing it from seeds will consequently be abandoned, as the young rooted offsets have simply to be planted where they are wished for, and they will flower as soon and as finely as the stocks from which they were taken. The showy dwarf hybrid members of this genus, of which *M. Smithii* may be given as an example, are not inferior in hardihood to *M. cardinalis;* and when it is thoroughly known that these plants can be grown, and their beauty enjoyed, without any of the trouble of potting, watering, housing, and propagating, they will certainly be more common than they are at present. Superior hybrids have stood in borders with which we are familiar, since last summer, with no sort of covering whatever, and are now advancing rapidly towards flowering. It is safer, nevertheless, to afford them occasional shelter. When an increase is desired, a few of the offsets can be detached, and they at once form excellent plants.

Having given so much space to herbaceous plants, or those which assume the character of herbs, we shall just mention two or three low shrubs, and then quit the subject. *Mahonia fascicularis*—a plant that stands almost unrivalled among evergreen shrubs, except by its congeners *M. aquifolium* and *repens*, is very susceptible of injury in the latitude of the metropolis, if the winter be rigorous; and though specimens, in favourable localities, have passed unharmed through the late trying frosts, others have been wholly killed. This, then, is a fit plant for the exotic border; and the two species above named, together with *M. glumacea*, will, though quite hardy, retain their foliage better, and blossom more vigorously, by being planted in a similar spot. *Berberis empetrifolia*, moreover, though nearly hardy, was so mutilated in some places by the frosts of last January, that it cannot recover its appearance for several years. Being a trailing plant, and eminently interesting, it would be a most appropriate embellishment of a prominent border. Finally, *Lantana Selloviana* could, with the timely assistance of an efficient covering, be made to bear our milder winters in such a border; and the richness, quantity, durableness, and liberal succession of its flowers, stamp it as a peculiar desideratum.

If we have not in the foregoing enumeration alluded to a great number of plants that might possibly thrive in the border before described, it is because we preferred specifying those which experience has proved to be actually susceptive of culture in the open air.

TREATMENT OF TECOMA GRANDIFLORA.

By dividing the vegetable kingdom into classes, according to the comparative excellence or worthlessness of the immensely diversified objects composing it, there will be found an exceedingly limited number worthy of being grown by the great mass of cultivators, and, at the same time, capable of accommodating themselves to an extensive variety of temperature and other circumstances. In proportion, therefore, to their fewness, and their high intrinsic value, a stronger necessity exists for making them universally familiar; and it is with this design that we purpose recording the properties of a plant which has been too long neglected, and which is scarcely ever observable in any but a displeasing and shabby state.

The species of *Tecoma* were formerly included in the genus *Bignonia*, to which they have the strongest affinity in habit, and in the form and disposition of their flowers; but the capsules or seed-vessels of *Bignonia* have a partition which runs parallel with the valves by which they open when ripe, while that of the capsules of *Tecoma* takes a contrary direction. The species on which we are now writing, though often called in nurseries and gardens *Bignonia grandiflora*, is properly a *Tecoma.*

T. grandiflora inhabits the vast regions of China and Japan, from whence it was conveyed to Britain about forty years back. It is not much unlike *T. radicans* in the size and colour of its branches, but does not grow quite so luxuriantly and rapidly, nor does it climb so readily. Like that species, also, it develops its flowers from the ends of the shoots; the panicles being, however, more lax, the individual blossoms pendulous instead of erect, the limb of the corolla more spreading, three times as large, and of a colour internally between orange and crimson, with dark streaks in the throat, and a light yellowish brown exterior.

It is an amusing fact, yet not altogether creditable to the parties concerned, that when a plant has, by absolute ill-treatment, been brought into an infertile and unornamental condition, it is forthwith denounced as a shy bloomer, and too unproductive of blossoms to merit growing. Such has been exactly the history of *T. grandiflora.* By some unaccountable negligence, the splendour of its flowers has been lost sight of, and it has been suffered to languish on in that half-dead, half-dying condition, to which every person is aware it is so easy to reduce the most magnificent climbing plants.

The enormous evil in the management of the present and many other exotic climbers, is the seclusion of the earth in which they are planted from sun and air. Culturists imagine that if they can conceal a tub of earth, or part of a bed or border, so as to cause their climbers to expose nothing but their branches and foliage, they have attained a supremely desirable object; and the health as well as inflorescence of the subjects of culture are sacrificed without scruple or thought. This is not the light in which we regard the case. Knowing the sheer impossibility of flowering some of the best climbing plants in our collections in any manner at all approaching to perfection, unless their soil be duly exposed to atmospheric action, we would choose rather to have that soil open, on a level with other things in the house, and to grow a less number of plants satisfactorily, than to have a more crowded arrangement, with perpetual sickliness as a concomitant.

In the management, then, of this species as a greenhouse climber, it ought to be kept in a light house, and if trained from the bottom to the top of the structure, the pot or tub in which it is placed should stand as high as the front stage for pots, and not be shaded or smothered up with other plants. By this means, the roots will be relieved from the danger of becoming saturated, as a facile control can be exercised over the supply of water, and the plant will soon lose its false character of being a sparing flowerer, by showing that it is naturally more likely to debilitate itself with a too liberal production of bloom.

But besides being a climbing species of no ordinary attraction, our plant may readily be converted into a greenhouse shrub. Planted in a pot or tub of moderate size, and subjected to the routine generally followed in the greenhouse, it may be made, by judicious winter pruning, and a careful regulation of its fluid resources, to protrude several branches when only three or four feet high, and to bear a large panicle of blossoms from the points of each of these. To bring it to such a condition, dryness in autumn and winter, proper pruning, free access of light, and the removal to a slight distance of all plants that would prevent the solar rays from reaching the receptacle to which it is confined, are the essential pre-requisites. It will be readily believed by those who know the plant, that a shrub with four or five panicles, each composed of ten or twelve of its spacious pendulous flowers, of which three or more expand simultaneously on every cluster, and remain open several weeks, must present a most gorgeous appearance.

Further, although so well adapted for the greenhouse, it is on no account to be excluded from the stove. In a house filled with stove species at Claremont, the seat of the King of the Belgians, the plants are kept so much drier in the latter portion of the summer than the generality of similar kinds, that not a few of them are more prolific of flowers than specimens of the same species in other collections. Among these, we have discovered plants of *Tecoma grandiflora*, barely eighteen inches in height, and obtained from cuttings in the earlier months of the season, blooming through September and October, with a panicle of flowers half as long as their stem. Their fertility had, no doubt, been occasioned by the effect of the dry heat on their juices, inducing them to expand blossoms instead of additional wood. Under like circumstances, consequently, the species will constitute a very welcome addition to the autumnal-flowering stove plants, and can be put on a stage without soon growing into an encumbrance.

When the climate of China or Japan is considered, and the many species of plants with which those countries have supplied us, and which are either hardy or half-hardy in our gardens, are taken into account, it will be conjectured that the *Tecoma* before us may be as little tender as *Kerria*, *Aucuba*, and numberless Japanese shrubs. Having been tried against a wall in three or four metropolitan establishments, it has not been seriously injured; and a mulching of hay, straw, or old bark over its roots in winter, to keep them from extreme wetness or frosts, renders it as safe as could be desired. It is highly probable that it might be treated as a shrub in the border of which mention is made in a previous page; for no climber will better bear reducing to a bush: and the more it is pruned, consistently with its capacity, the freer will be its production of inflorescence, since the flowers appear on the summits of the current year's shoots, towards increasing the number of which pruning has a direct tendency.

Under each system of culture here propounded, the soil should be composed of similar constituents. A light fresh loam, mixed with a small quantity of heath-mould and sand, to render it porous and preserve it from adhesion, will always be appropriate. When grown in pots, the plant can be shifted in spring, as soon as its buds begin to burst. A large pot is by no means necessary, until the specimens have reached a height of ten or twelve feet; and even then it will conduce greatly to augment its proliferousness if the roots be a little but not too strictly cramped.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR APRIL.

ARMÈRIA FASCICULÀTA. A very showy and shrubby species of Thrift, forming a neat dwarf evergreen bush, and producing its fine heads of pink flowers about the month of August. It is a native of Corsica, Portugal, and Spain, and approaches nearest to *A. maderensis*, which is said to be without a stem; though, in gardens, it is often erroneously called *A. scabra*. The open border is very suitable for it in the summer season; but it must be treated as a tender shrub, and kept in pits during winter. A sandy soil, and little water, save while it is growing, are indispensable. *Bot. Reg.* 21.

BOMÀREA SÍMPLEX. The genus *Bomarea* is a division from *Alstrœmeria*, to which it is very closely allied. Two good varieties of the above species are here figured and described by the Hon. and Very Rev. W. Herbert. They were found by Mr. Pentland, near Cuzco, in Peru, and flowered in the open border at Spofforth, where they are regarded as quite hardy. They appear to have a climbing habit, with ordinary leaves, but pale purplish flowers, the petals being lighter, of a dull yellow, and spotted. In one of them the flowers are borne in pairs on the peduncles, and are of a pinkish hue; another produces purplish blossoms in threes; and a third seems to have simple peduncles, with long and more pointed petals. All are interesting, and easily cultivated. *Bot. Mag.* 3863.

Callithaúma angustifòlium *et* viridiflòrum. Two curious but by no means beautiful plants, related to *Pancratium* and *Coburghia.* The bulbs of the last are peculiarly long, of nearly the same thickness throughout, and the flower-stalk is described as growing naturally to the height of a man. *C. angustifolium* is altogether smaller, with much narrower leaves. Both have long green flowers, which incline to one side of the stem, and spread horizontally. They were received at Spofforth by the Hon. and Very Rev. the Dean of Manchester, and flowered almost immediately, not growing more than a foot high. Mr. Maclean collected the bulbs in Peru, to which the species are indigenous. Probably the temperature of a greenhouse will be sufficient. *Bot. Mag.* 3866.

Chỳsis bractèscens. Large white flowers, with a yellow centre, and very conspicuous bracts, are the chief external distinctions of this fine species from *C. aurea.* Dr. Lindley remarks, however, on the importance of noticing closely the little markings or elevations in the lip of orchidaceous plants of this description, and states that in the species before us there are five smooth and equal ridges in the labellum. It was imported from Mexico by G. Barker, Esq., of Birmingham, and bloomed in the collection of that gentleman in April 1840. Like *C. aurea*, it should be placed in a rough wooden basket, suspended from the roof of a warm part of the orchidaceous house, and watered freely in the summer. *Bot. Reg.* 23.

Cobúrghia coccínea *et* trichròma. These splendid-flowering plants are here associated for convenience, being decidedly distinct. The former has roundish bulbs, and brilliant pendulous scarlet blossoms; while the latter has its bulbs more elongated and attenuated, with pale red flowers, which have their segments externally margined with pink, and are internally altogether pink, with a stripe of green on the outside, near the centre and the extremity. Both were discovered by J. Maclean, Esq., of Lima; *C. coccinea* inhabiting the Cordilleras, and *C. trichroma* the Andes. The Hon. and Very Rev. W. Herbert, to whose collection they were sent, had them potted in enriched soil, placing them in the open air during the summer and autumn, and observes that they "appeared to dislike sunshine and fine weather." When the leaves decayed on the advance of winter, they were set in the greenhouse, and flowered early in the following spring. *Bot. Mag.* 3865.

Còlea floribùnda. A stately stove shrub, indigenous to Madagascar, where it is called by the natives *Rei Rei.* It is remarkable for its erect branchless stem, which attains the height of seven or eight feet, and is surmounted at the summit only by the magnificent pinnated foliage, which forms a handsome head. The flowers, which have a yellow tube, with a whitish spreading limb, are of a bignoniaceous shape, and are borne solely on the old and lower parts of the stem, issuing in clusters "just above the places whence the leaves of the previous year had fallen." They are exceedingly attractive, and the whole plant is highly ornamental. A specimen blossomed, "probably for the first time in Europe," in the stove of His Grace the Duke of Northumberland, at Syon, in August last. *Bot. Reg.* 19.

Cròcus speciòsus *et* suavéolens. Handsome species, the first of which has several varieties, and the last varies a little occasionally in the colours of its flowers. *C. speciosus* is a Caucasian species, with beautiful bluish-purple blossoms, which expand in the autumn. It bloomed in the garden at Spofforth. There is also a white variety; a blue one from Transylvania, named *Transylvanicus*, which is in Mr. Osborne's nursery at Fulham; and a very superior one, termed *laxior*, which has more expansive dark-blue flowers, and is "cultivated at Mr. Young's nursery, at Milford, near Godalming, and at Mr. Pamplin's, Lavender Hill, near Battersea." *C. suaveolens* is a pretty, sweet-scented Italian species, with alternate purple and yellow segments to its blossoms, the yellow ones being neatly streaked. "Some bulbs of it were brought to England by the Hon. W. Strangways, and others have been sent to Spofforth from Naples by Professor Tenore." It is considered hardy. *Bot. Mag.* 3864.

Herbértia cœrùlea. An interesting little bulbous plant, somewhat like *H. pulchella*, (of which there are two varieties with darker and lighter-coloured flowers,) but having lovely cerulean blossoms, the outer portions of which become darker near the base, which is then white, with a few spots. It was found by Mr. Drummond in Texas, and requires to be kept in a greenhouse or frame. *Bot. Mag.* 3862.

Impátiens cándida. Another of the noble annual species growing on the Himalayan mountains, and lately introduced by the Hon. East India Company to the Horticultural Society's garden. It is a tall-growing plant, branching freely down to the base, with long narrow leaves, which have showy crimson serratures, and red glands between the leaves. The blossoms are large, white, and a little spotted with crimson. It is advised that all the tender annuals belonging to this genus be grown rather in the greenhouse than in the open ground; for in the latter situation their flowers lose that charming delicacy for which they are notorious. *Bot. Reg.* 20.

Triptílion spinòsum. This most delightful herbaceous plant, though long known to botanists, has never been successfully cultivated in Britain till it was obtained by Mr. Frost, gardener to the Countess of Grenville, at Dropmore, who has now managed to flower it for three successive years. It is a tender perennial, with fleshy roots and pinnate leaves; the flower-stems rising two feet in height, and bearing their brilliant blue flowers in corymbs. A few seeds have been saved, which have been induced to germinate; but no attempt has yet been made to divide it, though it increases annually in size. Hitherto it has been kept in a greenhouse, potted in sandy loam, with a portion of decayed leaves, and the ball of earth reduced in the autumn. Its native country is Chili. *Bot. Reg.* 22.

NEW OR INTERESTING PLANTS THAT HAVE LATELY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES.

Alyssum orientàle; *var.* variegàtum. For growing on rockwork, in dry borders or in pots, this very showy variety, originated as it appears in British gardens, is exceedingly useful. The beautiful variegation of its leaves, and the great liberality in which its rich yellow blossoms are borne through the spring months, render it highly attractive. Plants are blooming in a choice collection of Alpines at Messrs. Henderson's, Pine-apple Place.

Andrómeda tetragòna. This is a most delightful little Lapland species, with evergreen foliage, which is so arranged as to present the appearance of square stems. It grows only to the height of six or eight inches, forming a low compact bush. Specimens in the Epsom nursery have stood the late severe winter in a secluded spot without any detriment, and are now developing their pure white and comparatively large pendulous blossoms. It is a peculiarly charming little object, and well fitted for adorning rockwork.

Arbùtus—? A new species of *Arbutus* is at present flowering in the Epsom nursery, and elsewhere, which in the neatness of its foliage surpasses all its allies. This is of a somewhat oblong figure, with small and very regular serratures along its margins. The flowers are borne in upright spikes, are large, white, and very pretty, while some of them are expanded successively during five or six weeks. Having been kept in a greenhouse, it is not yet known what degree of cold it will endure.

Arbutus tomentòsa. Remarkable among its congeners for the numerous white downy hairs with which its leaves are clothed, and interesting on that account. Its blossoms have recently been produced in erect spikes at several nurseries, where it has been preserved in a cold pit. The flowers are white and pleasing; but the greatest interest attaches to the foliage.

Azàlea índica; *var.* spléndens. A superb variety, bearing the preceding name, has blossomed with Messrs. Henderson, Pine-apple Place; its flowers being like those of *A. i. Smithii*, though of a deeper ground colour, with darker spots, and of a far greater size. Its habit, too, is thought to be dwarfer and denser, and its whole aspect is superior. At the same nursery a double red variety, with flowers similar in hue to those of *A. lateritia*, is also exhibiting itself, and affords a very agreeable novelty.

Begònia heracleifòlia. By no means a handsome species, but particularly curious from the resemblance in its leaves and habitude to the common British *Heracleum*. It will be inferred from hence that its foliage is coarse, and clothed with long rough hairs, while its nature is that of an herbaceous perennial, apparently requiring a stove temperature. The flowers are elevated on tall stiff stalks, expanding in bunches at the extremity. They are dull pink, and unornamental. Messrs. Rollisson, Tooting, and other nurserymen, possess flowering plants.

Dendròbium díscolor. A specimen of this singular species unfolded its blossoms with Messrs. Loddiges two months ago, and was described, without the name, in our Magazine for March, p. 46. Another plant is again in flower at the same establishment, and its inflorescence is more conspicuous than that of the former specimen; so much so, indeed, as to render it quite worthy of commendation.

Dendròbium pulchéllum, *var.* The noble plant of *D. pulchellum*, at Messrs. Loddiges', has this season been most profusely covered with blossoms, and the species ranks almost as high as the specimen. But a lovely variety has also blossomed with these gentlemen, and is well defined by the darker tints of its flowers, and their appearance uniformly about three weeks prior to the expansion of those of the species. This last property, being permanent, renders the plant a most valuable one for the culturist.

OPERATIONS FOR MAY.

May is a month of great activity with the flower-gardener, being the main season for planting out the greenhouse or half-hardy plants that are to decorate the beds and borders through the summer. This operation should be commenced about the middle of the month, at which time everything referrible to the above class may be safely exposed, due care being taken, however, to have a flower-pot or something of the kind at hand, to invert over the plants in a case of unexpected frost.

In preparing beds for a fresh sort of flower, it is not necessary to manure them, as for vegetable crops. One general manuring in the winter is quite enough; and, on after occasions of new introductions, it is sufficient that the soil be well turned over. Flowers rarely require a rich earth; and most of those in use for occupying ornamental plots, blossom best in a rather sandy soil. For the ordinary kinds, any common earth may be employed; and it is only the succulent species of *Mesembryanthemum*, *Calandrinia*, *Portulaca*, &c. that need a peculiar soil, while for these it is not indispensable.

When the dwarfer sorts of tender exotics are transplanted, it will often be useful to pluck off any flower-buds that may be showing themselves, and to cut or pinch out all the tops of the shoots, fastening the remainder to the ground where necessary. It is as true in the culture of flowers as in moral philosophy, that a small present pleasure must be renounced when a greater future gratification will result from the sacrifice; and the culturist will frequently be called upon to forego the enjoyment of an early but feeble display of blossoms, in order to ensure a more extensive and durable subsequent exhibition. A neglect of this carries with it its own recompense; and is like the folly of the amateur who sensitively shrinks from pruning his rose-bushes for fear he should cut off the germs of flowers, and by so doing experiences consequences tantamount to those he sought to avoid.

Now is the time for the tasteful cultivator to bedeck his lawns and pleasure-grounds with summer climbing plants. The numerous beautiful herbaceous climbers at present known, and their very striking effect when judiciously disposed, render the employment of them for some such object imperative. To occasion a due variety, long erect rustic poles, various forms of iron or strong wire supports, and stakes of about three or four feet high, with an abundance of branches, may all be used for sustaining the plants. Specimens planted under the latter description of supporters, can be allowed to grow to the top of them, and then throw their branches around them in all directions, so as to trail on the border or turf. An agreeable appearance, and one which we deem somewhat novel, would thus be created.

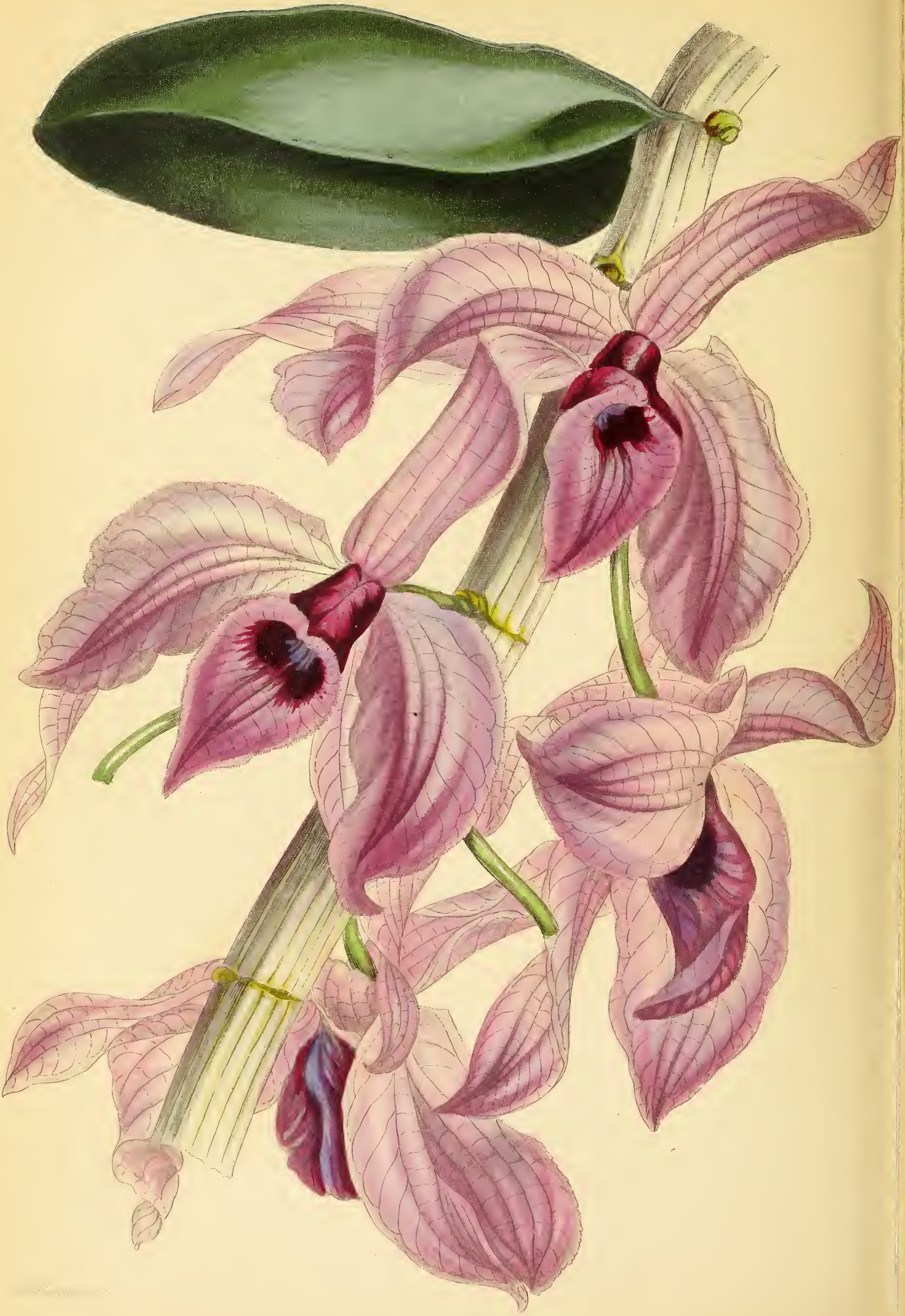
Petunias are plants that are not commonly seen trained to trellises, and yet, when they are not higher than three or four feet, nothing makes a more brilliant show than the taller-growing varieties, so treated, on small and circumscribed lawns. The fittest trellis for them is a wire tubular one, a foot in diameter, expanding at the top like a trumpet, and curving under at the edges, as the volutes of a capital of the Ionic architectural order. The flower-buds of the plants ought all to be removed till the branches reach the top of the trellis, when they can be left untouched, and a fine blaze of bloom will immediately burst forth. They will sometimes form an apparently entire mass of flowers more than four feet across; and a succession of blossoms will be unfolded for many weeks.

With numbers of plants that are retained in the greenhouse, the destruction of the flower-buds will be alike advantageous, provided the reason for doing so is always as clear. By repressing the flowers of a few specimens of *Pelargoniums*, shrubby *Calceolarias*, *Fuchsias*, and plants related in habit, they may be grown to almost any desired height within certain limits, and will afterwards flower quite as freely; while the same tribes, and other herbaceous varieties, can be retarded by such means so as to begin blooming when the rest fade,—thus perpetuating the succession of them far into the autumn.

Nor are measures of that class to be confined to flower-buds. To procure bushy specimens of certain species, the cultivator will find his efforts much aided by pinching off the extremities of the young shoots when they grow too long or too slender; thereby impelling them to develop a considerable quantity of lateral branches.

In the stove and orchidaceous house, the grand points requiring attention are, the copious administration of water, free syringing, shade where demanded, and the preservation of a high temperature. If Orchidaceæ happen to be so covered with insects as to require fumigation with tobacco, the flowering specimens should be taken away during the process, for tobacco-smoke destroys the delicate tissue of their blossoms.

Continue to sow and plant out hardy and tender annuals; make similar sowings in pots for the greenhouse; multiply forced pinks by cuttings; plant out *Chrysanthemums;* protect tulips if needful; propagate all sorts of in-door exotics; dress climbers; and attend promptly to the more ordinary operations which the daily observation and experience of all show to be essential.



Dendrobium macrophyllum.

DENDROBIUM MACROPHYLLUM.

(BROAD-LEAVED DENDROBIUM.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

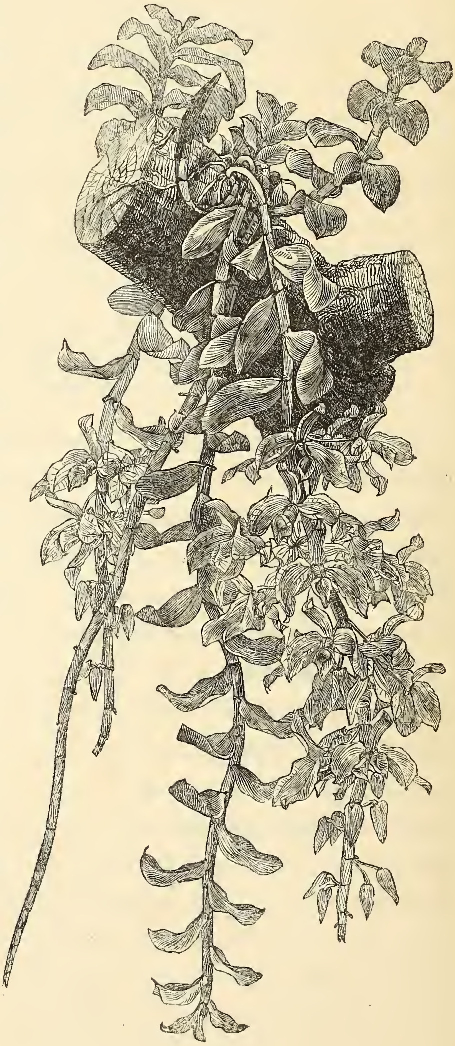
GENERIC CHARACTER.—*Sepals* membranaceous, erect or spreading, lateral ones larger, oblique, connate with the column at the base. *Petals* higher than the sepals, and often larger, though occasionally smaller, always membranaceous. *Labellum* with a foot articulated or connate with the column, constantly sessile, undivided or three-lobed, sometimes membranaceous, sometimes appendiculate. *Column* semi-cylindrical, very much lengthened at the base. *Anthers* two-celled. *Pollen-masses* four, collateral, equal.

SPECIFIC CHARACTER.—*Plant* epiphytal. *Stems* strong, pendulous. *Leaves* ovate-oblong, obtuse, distinctly nerved, subcordate at the lower part. *Sepals* lanceolate, lateral ones equally lengthened. *Petals* oblong, obtuse. *Labellum* pubescent, folded, with small teeth, ovate, subunguiculate, thick below, with three elevated, transverse, obsolete lobes.

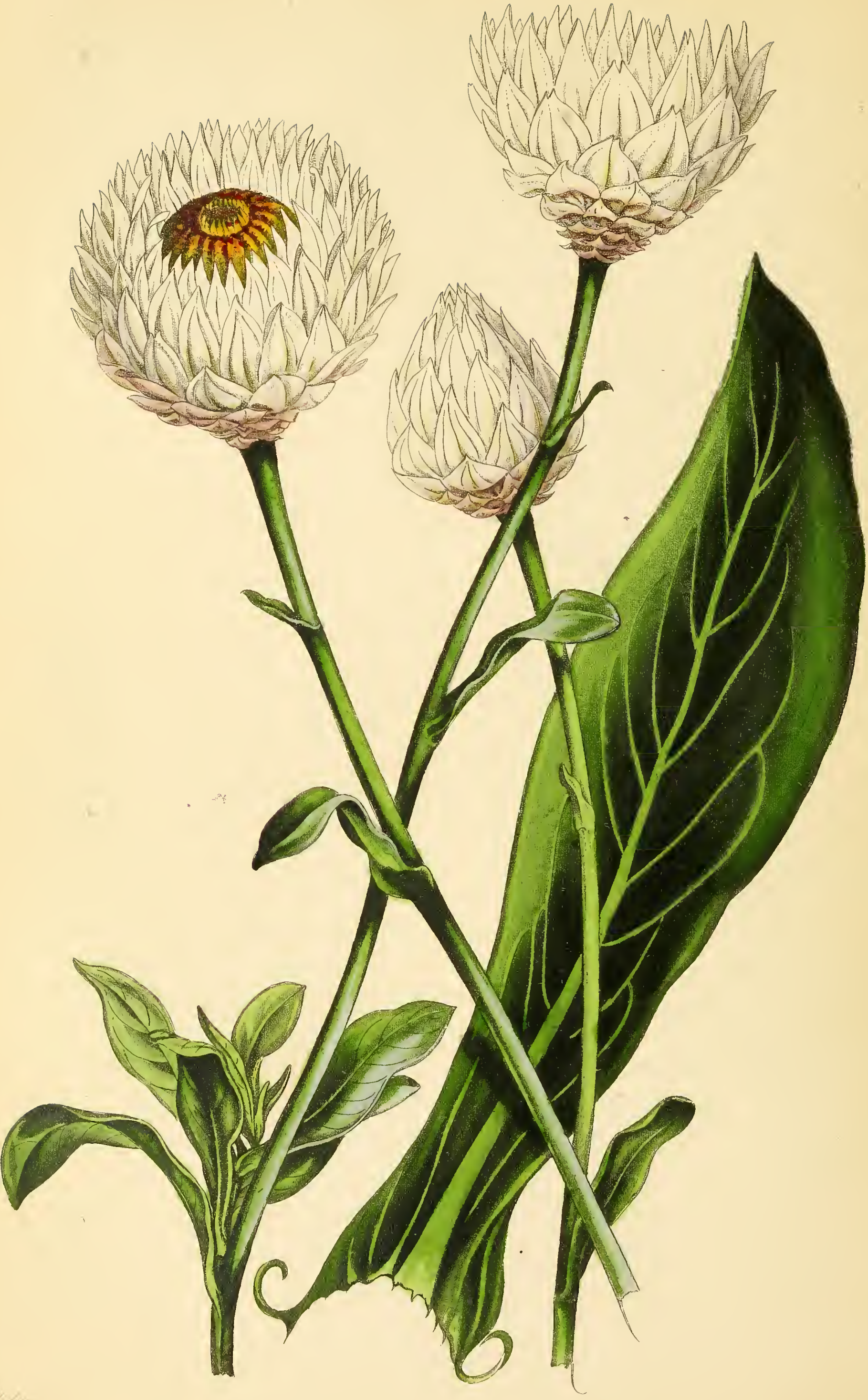
So rapidly do new species of this splendid genus succeed each other, all having some additional claim to regard, that scarcely is one pronounced to be the most beautiful ere another appears to supplant it. The fact is, that each has an individual and peculiar attractiveness; and, were it not next to impossible to determine which possesses it in the highest degree, we should certainly feel disposed to give pre-eminence to the superb species figured on the opposite page.

D. macrophyllum is of the class usually called caulescent; the stems being, moreover, destitute of hairiness, and pendulous. In their young state, they are of a pale, tender green hue, thickly covered with leaves, from eighteen inches to two feet long, and of nearly the same size throughout. After the first year, however, they lose their foliage, and become encased in a series of whitish sheaths; bearing the flowers sometimes in the first season, and occasionally not till the second, near their extremities. The leaves are thick, comparatively short and broad, deep green, and sessile, assuming the width characteristic of the species chiefly in large and old specimens. Of the lovely flowers, our drawing affords a very correct idea. From twenty to thirty are borne on a plant of moderate age, during the months of March and April, and we have observed quite small specimens producing a profusion of blossoms. Their great dimensions, pleasing pink colour, tinged with purple, and variously shaded with the rich reddish purple of the labellum, and the prominent veins of the sepals and petals, all more or less tend to create or heighten their charms.

Messrs. Loddiges imported this fine plant from Manilla, about three years ago. It was collected and sent to Britain by Mr. Cuming. A plant flowered imperfectly in the collection of the above gentlemen in April 1839, and the same specimen blossomed in a much superior manner at a parallel period in 1840. The present season has developed a still greater number of blooms; and in April last, it was a most gorgeous object. Messrs. Loddiges have recently introduced an immense bunch of this species from a neighbouring island to that before mentioned, the flowers of which were developed on the voyage; but, as in many other cases, the stems are not so luxuriant as those grown in England.



The character of the species, its drooping stems and flowers, and the necessity there exists for witnessing the latter either above or on a level with the eye, at once show the propriety of cultivating it on a wooden block, over the edges of which the stems may hang. A small wooden basket would, however, be equally suitable. Sphagnum moss, or light fibrous heath-soil, should be selected for planting it in, or placed around its roots; and it must be watered very abundantly and constantly while its developments are progressing, and kept in a warm, moist part of the orchidaceous house.



Helichrysum niveum.

HELICHRỲSUM NÍVEUM.

(SNOW-WHITE-FLOWERED HELICHRYSUM.)

CLASS.
SYNGENESIA.

ORDER.
SUPERFLUA.

NATURAL ORDER.
COMPÓSITÆ.

Generic Character.—*Capitulum* many-flowered, sometimes homogamous, with all the flowers tubular, hermaphrodite, five-toothed; sometimes heterogamous, with the flowers of the ray in one row, frequently a very few slender females. *Involucrum* imbricated, scales scariose, interior ones connivent or radiant. *Receptacle* plane, not paleaceous, now naked or areolate, now delicately fringed. *Achenium* without a beak, sessile, with a terminal areole. *Pappus* in one row, with subscabrous bristles, (or feathers,) sometimes free, either equally united at the base, or unequally coadunate or branched.

Specific Character.—*Plant* perennial, herbaceous, or subshrubby. *Stems* strong, erect, nearly simple, about four feet high, scabrous. *Leaves* oblong-spatulate, pubescent on both sides, with the base of the petiole narrow and partially clasping the stem. *Heads of flowers* large, solitary, terminal. *Involucral scales* white on both sides, connivent, ovate, mucronulate.

From the beautiful *H. macranthum*, a species, like the present, indigenous to the Swan River Colony, *H. niveum*, though not remarkably different, is easily distinguished by the absence of any pink colour in the involucral scales, or exterior petal-like portions of the flowers, and by the general strength and vigour of its habitude. The latter circumstance, offering, as we conceived, a better mark of distinction than the want of tint in the blossoms—many other species having these equally white—induced us to name it *H. robustum*, under which appellation it may be found in some of the London nurseries. But a figure of it having since been published in the Botanical Magazine, where Dr. Graham has called it *H. niveum*, on account of the supposed purity of the white in its flowers; from a desire to avoid confusion, we relinquish our own designation, and adopt that now given.

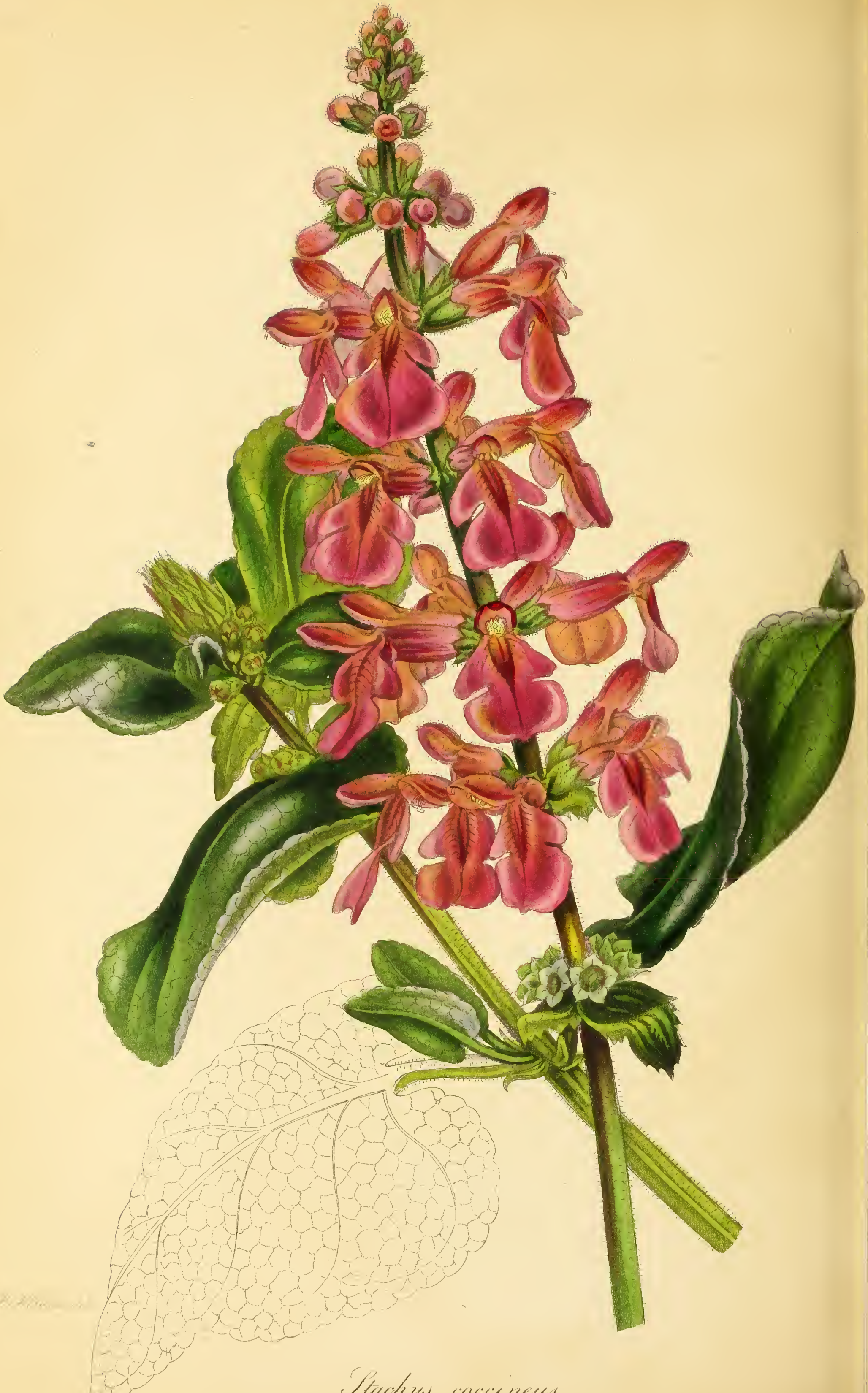
This species was primarily brought into notice, we believe, at the Clapton Nursery, seeds having been sent to Mr. Low by Mr. Drummond, who had collected them at the Swan River settlement. Other individuals procured some, however, almost at the same time; and among those were Messrs. Young, of Epsom, from whose establishment our drawing was prepared in August 1840.

It is a particularly free-growing and free-flowering plant, resembling *H. macranthum* in its extra-herbaceous or subshrubby nature, and in the number, size, and duration of its flowers. These are, indeed, occasionally a little larger than those of the species just named, but they want that delicate shade of rose which renders that plant so deeply interesting. Specimens which begin to blossom in July, in the open ground, will continue unfolding their flowers till the commencement of frost; and even then, by a judicious and careful removal into pots, they may be made to bloom far into the winter.

Treated as an herbaceous plant, we are not sure that it is perfectly hardy, those which have been noticed by us being kept in a frame through the winter. The best mode of managing it, however, is to raise it, early in each spring, from fresh seeds, as a tender annual, and permit it to perish in the autumn. By this system, the plants will be more healthy, and the flowers altogether finer.

It is advisable to leave one or two of the largest plants entirely for seed, plucking off the flower-buds after a sufficient number of the earliest are expanded, and so allowing the remaining ones a better chance of perfecting their maturation. From flowering plants, on the other hand, all the old blossoms may be gathered as they fade, which will cause a greater development of additional ones.

Helichrysum is taken from *helios*, sun, and *chrysos*, gold, the blossoms of some of the original species being of a brilliant yellow colour.



Stachys coccineus.

STÁCHYS COCCÍNEA.

(SCARLET-FLOWERED HEDGE-NETTLE.)

CLASS.	ORDER.
DIDYNAMIA.	GYMNOSPERMIA.

NATURAL ORDER.
LABIÀTÆ.

Generic Character.—*Corolla* with the upper lip arched; lower lip broad, reflexed; middle lobe largest, emarginate. *Stamens* inclining towards the reflexed side.

Specific Character.—*Plant* herbaceous, perennial, growing from a foot to eighteen inches high. *Stem* square, with obtuse angles. *Leaves* ovately-cordate, crenated, hairy. *Flowers* usually six in a whorl, red or scarlet. *Calyx* campanulate, five-toothed, hairy. *Tube of Corolla* nearly straight. *Germen* four-cleft, on a raised fleshy receptacle.

Our sole reason for introducing a figure of this valuable old plant is one by which we frequently suffer ourselves to be actuated—the desire to restore to general favour an extremely showy object, over which a shadow has long rested. Forming one of a large group which every successive season brings into yet greater request, we wish to see it no longer kept in the shade, but ranking with the most esteemed of related plants, in the adornment of the border and parterre.

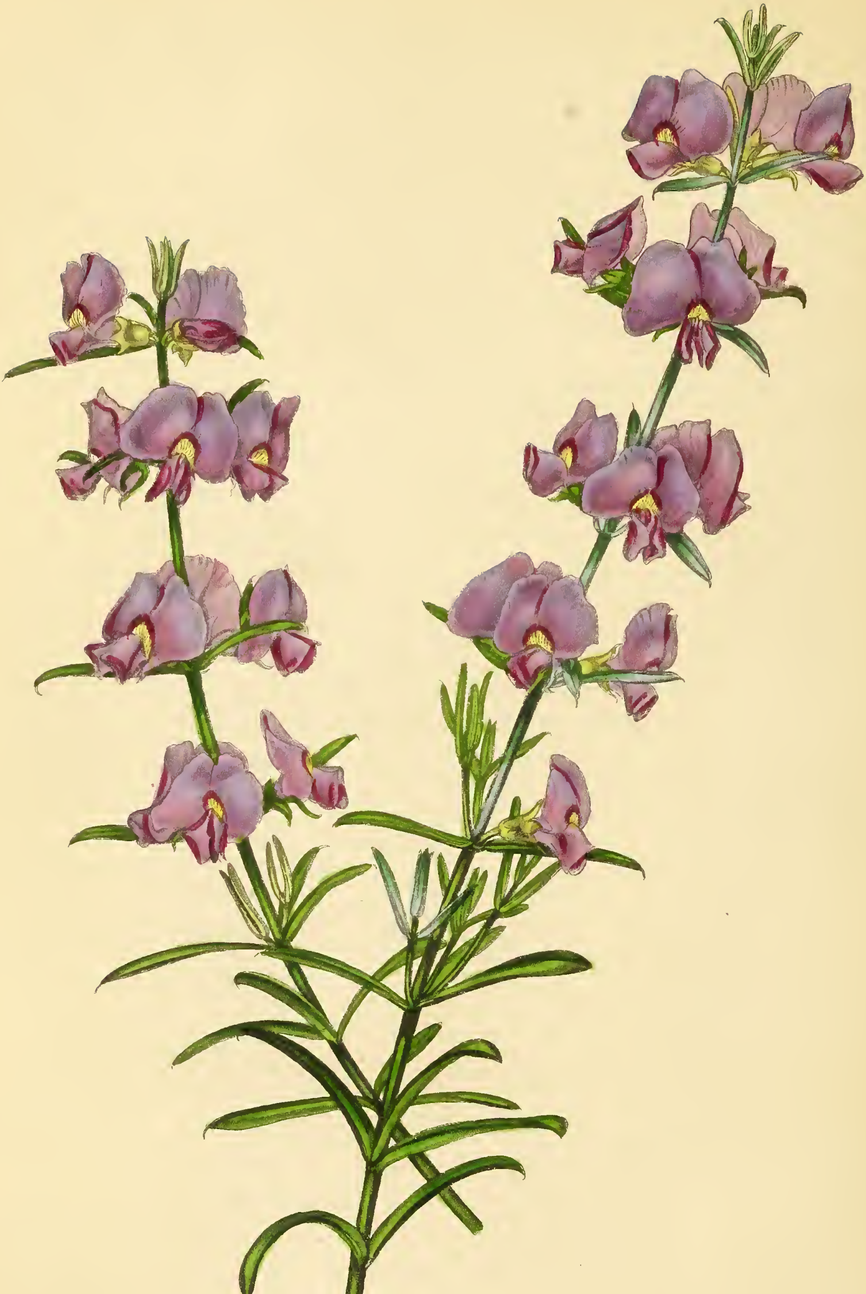
The group to which we have above alluded is composed of those highly beautiful and interesting species which are too tender to thrive continually in the open ground, but which, when properly conserved in frames during winter, lend a grace to the summer plot, which no purely hardy plant could commensurately furnish. Next to hardy herbaceous perennials, their management is of the most simple description, and attended with the least possible trouble or expense. A common frame to cover them in the winter, maintained so dry and cool that when severe frosts occur it may be thoroughly enveloped in litter or leaves for a lengthened period, without any attention, is all the protection they demand; and the only other culture requisite is once potting, occasional waterings while in pots, propagation in the autumn, and transplantation in the month of May.

Of this class, so useful to cultivators of every grade, and, more particularly, to the amateur of small means, *Stachys coccinea* is an admirable example; although its treatment may be somewhat different, as respects propagation, from that of other half-hardy perennials. It is a native of Chili, a fact that goes far to prove that it cannot be acclimatised; and for all garden purposes, it should be placed with Verbenas and similar plants.

The stock reared from cuttings or divisions in the previous autumn, and preserved in frames through the winter, can be planted out, either in beds or in patches, along the borders, about the middle of May, and the plants will open their first blossoms in July; afterwards retaining their beauty, by repeated expansions, till October. The height to which they grow, (a foot or eighteen inches,) renders them unfit for filling very small beds; and it is, therefore, necessary to restrict them to larger ones, when the plan of grouping is preferred. In the month of August they may be increased by cuttings, planted in a trifling heat, under a glass; or, as a more certain variation of the ordinary practice, the younger offsets can be detached, with roots, and immediately placed in small pots for the winter.

There are two varieties of this species in nurseries and gardens. At Messrs. Young's, of Epsom, whence the present figure was taken, there is the old kind, with dull brick-red coloured flowers; and a superior variety, with brighter-hued blossoms, approaching to scarlet. The last is unquestionably preferable.

The genus derives its name from *Stachys*, a spike, in reference to the production of the flowers in what is termed a spike by botanists.



Holden del.

Mirbelia floribunda.

MIRBÈLIA FLORIBÚNDA.

(MANY-FLOWERED MIRBELIA.)

CLASS.
DECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LEGUMINÒSÆ.

Generic Character.—*Calyx* five-cleft, two-lipped. *Legume* two-seeded, longitudinally two-celled, from the suture being bent inwards above.

Specific Character.—*Plant* shrubby, evergreen, two feet in height, or upwards. *Stems* villous while young. *Leaves* linear, thick, mucronate, slightly folded under at the margins, pressed near the stem. *Flowers* numerous, purplish-lilac, with a yellowish spot in the centre near the base of the standard, surrounded with a darker purple band.

The foregoing title has been applied by Dr. Lindley to an exceedingly attractive species, of which the seeds were received from New Holland, and germinated about three years back. Its principal peculiarity is the astonishing prodigality in which the blossoms are developed, and from this cause, as well as from their beautiful bluish-purple colour, it stands very high among the charming products of the same climate, the mass of papilionaceous flowers, and, more especially, the members of the genus *Mirbelia.* In short, we may state that, considering the individual showiness of the flowers, their combined effect when simultaneously protruded, and the liberal manner in which very young specimens produce them, there has not been a more ornamental Australian plant made known in England for several years.

When first blossomed by Messrs. Loddiges in 1840, at which period and in March of the present year our figure was executed, it was thought to be the *M. speciosa* of Siebold; and in what respect it differs from that species beyond the greater quantity of its flowers, we have not at present the means of determining. It must suffice to declare that its claims to be regarded as a new species have been asserted by Dr. Lindley, and that it excels, on the whole, all its congeners with which we are acquainted. Its entire habit is favourable to the formation of those admirable dwarf specimens which are the pride of our greenhouses; while the great length of time the flowers remain perfect, and their expansion at an early period, or during the months of March and April, stamp it with a striking and sterling interest to the culturist.

Being what is popularly termed a hair-rooted plant, or possessed of numbers of minute, fibrous rootlets, it requires some care in its cultivation. Wholly without a tendency to rank or exuberant growth, the soil in which it is potted should be composed of those ingredients which will not beget or foster such a disposition; for whatever would radically change its character in this way, would no doubt likewise prejudicially affect the inflorescence. The compost most suitable is, consequently, a mixture of light, sandy loam and heath-soil, of which the latter should be in the proportion of six parts to four. If the soil be elevated slightly in the centre of the pot, so as to leave the neck (or that portion from which the stem and the roots jointly issue) freely exposed, the health of the specimen will be further secured. Free drainage, and the proper adjustment of the earth about the roots, are matters on which nothing need be said.

Cuttings of the younger shoots, taken off shortly after they are formed, and potted in sandy soil, under a glass in the propagation house, will root with tolerable certainty; and the pruning necessary to obtain these cuttings will be rather beneficial to the plant, which is not naturally prone to emit too many branches.

Sir. J. E. Smith created this genus in honour of M. Mirbel, one of the most celebrated French investigators of physiological botany.

OF GARDENING AS A SCIENCE.

NO. V.

We resume our inquiry at the point where we quitted it at page 84, with the allusion to that most wonderful provision of nature, by which a gas of very poisonous and deadly quality is removed from the atmosphere, and converted by the agency of vegetation to the food of plants, and the comfort of man.

Carbonic Acid, or fixed aërial acid, is the inevitable product of combustion and respiration; and the atmosphere is the recipient of the gas so produced. Any one may convince himself that it is always present, by exposing a little pure fresh-burnt lime, or a glass of strong, and brilliantly clear, lime-water to the air, for a day or two. Neither of these would hiss, (effervesce,) were a drop or two of any acid applied to it; but, after being so exposed to the air for some time, the lime would be converted to carbonate of lime, and the lime-water would lose its pellucidity, and be covered with a scale of a brittle, insoluble substance. Both would effervesce, with the extrication of frothy air-bubbles; and these changes are produced by the attraction exerted by the pure lime upon the carbonic acid of the atmosphere, which causes a union of the two, and the formation of that neutral salt of lime commonly known by the term chalk. We approach to an estimate of the actual quantity of this acid contained in the air by perusing the note at page 17 of Liebig's work.

"The air contains, in maximo, $\frac{66}{100000}$ of carbonic acid, and $\frac{21000}{100000}$ of oxygen gas. A man consumes in one year 166075 cubic feet of oxygen gas (or 45000 cubic inches in one day, according to Lavoisier, Seguin, and Davy); a thousand million men must accordingly consume 166 billion cubic feet in one year; this is equal to $\frac{1}{1000}$ of the quantity which is contained in the air, in the form of carbonic acid. The carbonic acid in the air would thus be doubled in a thousand years, and man alone would exhaust all the oxygen, and convert it into carbonic acid, in three hundred and three times as many years. The consumption by animals and the process of combustion is not introduced into the calculation."

There is not, perhaps, in the whole economy of wonder-displaying nature a fact more conclusive, more simple, and yet more astounding than the one which the foregoing extract reveals. For if some agency were not unceasingly at work to withdraw that volume of poisonous gas, which every act of combustion and respiration pours into the air, the whole would inevitably be converted into a pestilential vapour. *Nitrogen* is destructive of breathing life—and of it we have seen that no less than $\frac{4}{5}$ths of the entire atmosphere consists; the remaining fifth of oxygen is the sole meliorator—and of it every breath we inspire consumes a portion. Then, must we not inquire with Liebig, "How does it happen that the proportion of oxygen in the atmosphere is thus invariably the same? Carbon and the elements of water form the principal constituents of vegetables; the quantity of substances which do not possess this composition being in very small proportion. It is therefore certain that plants must possess the power of decomposing carbonic acid, since they appropriate its carbon for their own use. The formation of their principal component substances must necessarily be attended with the separation of the carbon of the carbonic acid from the oxygen, which *must be returned to the atmosphere*, whilst the carbon enters into combination with water or its elements.

"The atmosphere must thus receive a volume of oxygen for every similar volume of carbonic acid which has been decomposed."

Thus reasons our author; but upon this great miracle of nature he advances no novel idea; he only brings us back to the observations of Dr. Priestley, Sennebier, De Saussure, and others; but his modes of proof, his deductions from calculation, are his own. That many have doubted the grand facts which he now confirms, is true as it is lamentable; for there is not in all creation one other traceable agency by which the destructive increase of carbonic acid could be prevented, if we deny it to vegetable vitality! "The life of plants is closely connected with that of animals in a most simple manner, and for a wise and sublime purpose. The presence of a rich and luxuriant vegetation may be conceived without the concurrence of animal life; but the existence of animals is undoubtedly dependent upon the life and development of plants.

"Plants not only afford the means of nutrition for the growth and continuance of animal organization, but they likewise furnish that which is essential for the support of the important vital process of respiration; for, besides separating all noxious matters from the atmosphere, they are an inexhaustible source of pure oxygen, which supplies the loss which the air is constantly sustaining. Animals, on the other hand, expire carbon, which plants inspire; and thus the composition of the medium in which both exist, namely the atmosphere, is maintained constantly unchanged."

This beautiful reciprocity speaks volumes: it sets aside that weak appeal to the agency of humus which has of late years been so imperiously urged. The presence of manuring matter in the soil, and the important changes which it operates, have doubtless tended to blind us to the more important agency of the atmosphere; but why decaying vegetable matter—whose decomposition is effected by the agency of air and moisture—should be identified with the *artificial humus* of the laboratory, is a mystery. If such be the results of the application of chemistry to the theory of agriculture, we are free to confess that we should prefer the ignorant routine of our forefathers. They pay a poor compliment to science, who thus misapply its discoveries!

GARDEN ARCHITECTURE.

THROUGHOUT the whole history of gardening, no point presents a more anomalous aspect than the form and style of structures for the conservation of plants. From the time at which the massive gloomy erections in which greenhouse species were first imprisoned prevailed, to the period when the graceful curvilinear metallic roofs were originated, a total want of taste, or inappreciation of the objects desired to be attained,—extravagant notions of economy, and ignorance or neglect of the true principles of plant-culture—seem to have been little less than universal.

That this comprehensive condemnation may not stand unsupported, we shall strive to show what constituted the most palpable and glaring errors of past epochs, and to what causes they were chiefly due. It will not be necessary, in such an attempt, to go far back into the olden times, and bring under review the conservatories and orangeries of the last century; since our purpose is to attack the evil in its more recent shapes, leaving the venerable specimens of ancient architecture to that unsparing and impartial hand which will not fail, ere long, to obliterate all standing traces of their existence.

Thickly as the face of our country is studded with greenhouses, and conservatories, and other similar manifestations of a refined taste, we regret to observe that the enlightenment of which they may be supposed to be the indication is very rarely apparent in their outline; or, where architectural beauty and congruity are realized, they are generally at the expense of something that essentially conduces to the health of the plants. The proprietor who would be laudably emulous in securing proper proportions, and style, and finish for his mansion, and providing for the convenience, and comfort, and health of its inmates, will nevertheless think his garden beautified, rather than defaced, by structures that evince as utter a disregard of architectural rules as of vegetable physiology. Nay, if these same abortions be an appanage to the house, and their character as remote as the antipodes from that observed in the principal features of the latter, they are still not only tolerated, but viewed with pleasure, as if it were not practicable to render them conformable to the prevailing style.

In noticing the faults complained of according to the order of their magnitude, the first would assuredly be a lack of any prominent characteristic or order, of congruity, of proportion, of chaste, real, and appropriate ornament; or, where any or most of these are aimed at, there will usually be found an insufficient adaptation to the purposes of the culturist, and a heaviness, darkness, and inelegance which are nearly as objectionable as the defects previously mentioned. What, for example, can be more unsightly than a plant-house of considerable elevation, with a plain, perpendicular back wall, and a long glass front, sloping in one direction to the other wall that supports it? And where, again, will the eye of taste or the scientific cultivator meet with greater offence than in the heavy erections, half stone or brick, half glass, additionally shaded and darkened with pillars and pilasters, pediments, cornices, and the other appendages of a purely architectural composition? These, then, are the two great and serious grounds of complaint,—always, be it remarked, varied and modified to some extent,—that we have to urge against the majority of floricultural houses at present standing in Britain. We must enlarge briefly on each.

The former, from being the most common, requires earliest and longest consideration. From the dismal dungeon-like buildings constructed by the original horticulturists of this country, the most marked change—and a change, too, certainly for the better—was to the ordinary lean-to houses, with brick back walls the height of the entire erection, and low front ones of similar materials, the slope between, and the ends and front to within a certain distance of the ground, being covered with glass. When this improvement first occurred, it was doubtless hailed as comprising all that could then be wished for. But the taste for architectural symmetry and effect has since been so wonderfully diffused, and a regard for exterior appearance has become so extremely general, that even the cottages on an estate are now designed and built with a view to render them pleasing; and surely it will not be contended that the structures destined to cover, and exhibit agreeably, many of the most elegant and lovely objects in creation, should alone be left behind in the flow of refinement.

Nothing can be more easy than to prove that the kind of houses we have just been describing are the very reverse of beautiful. They are destitute of one of the main constituents of beauty—symmetrical proportion; and when seen from the end, present a contour of the most displeasing figure. They have invariably an ugly back wall in the inside; and the same disagreeableness of outline which marks the exterior is equally apparent when the observer is within the house. They always call to mind a series of slovenly back sheds, fire-places, &c., and violate a principle, which is now never neglected in superior residences, that all sides of the building may be gazed upon without meeting anything inferior or repulsive. In fine, if looked upon from the front—where alone they are at all tolerable—their slope is too long, too steep, too flat, too undiversified, to accord with any true idea of beauty, whether natural or acquired.

With regard to the well-doing of the plants and the waste of material, they are further improper. In the long slope of the roof, and the height of the glazed ends, much glass is used that might be far more advantageously employed; while the high brick wall at the back excludes light, prevents the passage of heat and air through the house in summer, and, by refraction, often, at that season, causes the temperature to rise immoderately and suddenly on a trifling temporary period of sunshine. A point of even greater moment, however, is the distance at which many of the plants are unavoidably kept from the glass, the full influence of which circumstance can hardly be conceived.

These observations all apply with unabated force to what are termed "ranges" of houses, or whatever approximates to them. They are characterized by the same want of symmetry, except from the front, the same irregularity of shape, the same flatness, heaviness, dulness, formality. Even when relieved by domes or other central and terminal elevations, they are merely interesting from a single point of view; and though so much modified as to take the form of a crescent or semicircle, the spots from which they can be admired are not multiplied by the alteration, agreeable as it is in itself.

Passing to those houses in which a particular architectural style is actually made use of, and to which, by consequence, many of the preceding objections are inapplicable, for superficial symmetry is more or less a component of every recognized mode of building, and strikingly so of the Grecian or semi-Grecian orders, which are mainly employed in garden architecture,—we have faults of another kind to disclose. Primarily, then, we protest against all such horticultural buildings when they bring into use brick or stone materials higher than a few feet above the level of the surrounding earth, inasmuch as they tend to subvert a law of which the experience of all attests the accuracy, and on the preservation of the inviolability of which so much depends.—It is, that everything should be avoided that in any way intercepts the passage of light through the roof and sides; and where the principal or supporting parts of a structure are of brick or stone, it is peculiarly difficult to keep these within due dimensions.

We reiterate and confirm our opposition to such structures for another and equally cogent reason. They are utterly unsuitable, in point of taste, for housing any kind of ornamental plants; their disproportionate strength, and the massiveness of their parts, being quite incongruous with the lightness, grace, and naturalness of the objects they protect. There is, in truth, too great an appearance of art, with a total want of that airiness, liveliness, and buoyancy which raise an image rather of an endeavour to enhance the attractions of the scene spread before us in the interior, than of a necessary screen to secure them from the inclemency of the weather. Hence, all plant-houses in which brick or stone are unsparingly employed, give a perpetual notion of the inhospitable nature of our climate, oppress the mind with a continual sense of pain for the safety of the plants, and keep up a constant recollection of that ungenial season when extra artificial shelter is absolutely indispensable to guard against frost.

One exception only can ever be admitted to these strictures. Where it is the wish of the proprietor that a conservatory or orangery should form a department of the mansion, by all means let the style be in exact accordance with that which distinguishes the general building. In this case, there is no alternative. The conservatory must either be constructed in the same character as the house, or it must be perfectly detached. For the sake of the plants, however, it is much to be desired that erections of that sort should not become general.

Other evils, of less importance than those previously spoken of, might here be portrayed; but, as they do not involve such high principles, we shall content ourselves with merely enumerating a few. Thick sash bars and rafters are, when unnecessary—as they are in most instances—both hideous and prejudicial; needlessly strong supports to stages are highly inelegant; small squares of glass, with their numberless laps, detract greatly from the beauty of a house, and cause inconceivable damage to plants by the drippings they occasion; an extensive ascending series of wooden stages is, to our eyes, extremely ill adapted for ornament and for use; and finally, the absence of facilities for producing a current of air *across* the house, on a level with the plants, by ventilation, is grossly impolitic.

It requires no ingenuity to account for the way in which so decidedly tasteless a style of building as that first depicted in this article should have arisen. Without question, it has its origin in the gardening profession. Gardeners being in former times but seldom devoted to literary pursuits, and bent solely on the mastery of the different practical departments of their art, had neither inclination nor leisure for a study of the elegant arts; and architecture, though most closely connected with their pursuit in various ways, has been, and is now, too generally considered foreign to a gardener's education. The result is, that not one in ten knows anything of the principles of architectural taste; and thus, when called upon to construct houses, we see them providing for what they are aware, by experience, is essential to their success as cultivators, but altogether forgetting, or quite accidentally following, the rules which taste dictates. To gardeners, then, are, in almost every case, clearly attributable the violations of established proprieties which so forcibly strike the intelligent tourist in his examination of British plant-houses.

On the other hand, the gloomy, unsuitable structures we occasionally meet with, which betoken a more or less knowledge of architecture, but no acquaintance with vegetable wants, are as plainly to be imputed to the professed architect. He, like the gardener, imbued deeply with the love of his profession, and impressed chiefly with the desire to produce an object which will do honour to his own *exclusively professional* skill and talent, leans to an opposite, but fully as erroneous an extreme.

To obviate the perpetuation of similar faults, we have a hint to offer to proprietors and to gardeners. To gentlemen anxious for increasing their floricultural establishment by the addition of new or the enlargement of old erections, we would suggest the necessity of consulting, first the gardener, as to the eligibility of the spot fixed upon, the aspect, kind of roof most suitable, &c., and where his ability is competent to the task, confiding the preparation of a design entirely to him, merely submitting it to the judgment of an architect in the case of any unsatisfied scruples existing in the breast of the proprietor as to the fitness of certain parts. For smaller buildings, every gentleman is himself qualified to determine the merits of a design; and the assistance of an architect will be needed only when a work of great magnitude is to be undertaken, or when doubts arise concerning any particular feature.

On the gardener, we wish vividly to impress the desirability of mastering the elements of architecture. No art is, as far as relates to its outlines, less intricate; none is more delightful during its acquisition; from no subject, when thoroughly within the grasp, can a higher degree of pleasure result; and nothing is better calculated to exert an exalting influence on his taste and mental powers, or to assist him more powerfully in compassing the higher branches of his profession. No person, indeed, can ever aspire to landscape-gardening without an acquaintance with architecture.

If, in this paper, we have dealt largely with principles, and merely negative statements, it is because we intend plunging deeper into the details, and explaining our opinions of what garden architecture ought to be, in one or more subsequent papers.

STOVE AQUARIUMS.

In how few of even our first-rate floricultural establishments any effort is made to cultivate stove aquatics on a scale adequate to their great merits, or in a manner likely to ensure success, is matter of common remark. The real grounds of such inattention cannot, we should imagine, be so generally known and felt, or they would more speedily be removed.

A notion has long been current, and, as in similar cases where a preconceived prejudice is flattered, has gained considerable credence, that exotics of this description do not ordinarily flower abundantly enough to warrant their more frequent culture. But if the treatment bestowed be at all appropriate, nothing can be more unfounded than that belief. It is true that stove aquatics, like every other tribe of plants, will not, under adverse circumstances, develop their flowers freely, and sometimes, when similarly checked, do not unfold a single blossom; yet the same position holds good with many of our most prolific stove ornaments, and arguments deduced from thence to prove their want of fertility would be unjust and fatuous in the highest degree.

Another source of the low position these plants occupy in public esteem, is the miserable and often dirty condition in which they are commonly witnessed when confined to small boxes, cisterns, or tanks, where they have neither room enough to perfect their growth, sufficient nutriment to produce flowers, nor the opportunity of exhibiting either to advantage. From the limited quantity of soil which can be placed in the bottom of such vessels, the trifling surface of water they present, and the consequent rapidity with which it evaporates in the summer, thereby frequently leaving the plants in a partially dry and flagging state, together with the crowded arrangement of the leaves, so detrimental to their appearance and obstructive to their functions, it cannot be expected that they should be interesting or gratifying when so treated.

The point, however, which most of all has contributed to weaken their influence, and impart an unfavourable opinion of them, is the indifference of cultivators to a natural phenomenon which cannot be overlooked with impunity. It is well known that water is always much colder than the air in hot summer weather, and that to whatever extent we may inclose and heat a volume of air artificially, a body of water within the same area will maintain its heat relatively below that of the atmosphere, as it would in the external air. Now, assuming that stove aquatics require as high a temperature (or nearly so) as stove shrubs, it is plain that this is not furnished by the ordinary methods of heating, and that a cistern or aquarium must have a purely independent supply of heat, or rather, be traversed by pipes connected with the general apparatus, before it can be fitted for cultivating aquatic plants to perfection.

What is thus argued from a reference to familiar natural laws, is fully demonstrated by observation and practice. In the two or three aquariums which have been formed beneath our notice, wherein those natural principles were duly regarded, the issue has been truly extraordinary. Plants that ordinarily wear a starved, sickly, and meagre aspect, have put on the appearance of the most vigorous health; flowers, which before no management could elicit, have become not only profuse, but of a comparatively gigantic size; and a feature of the most striking and sterling beauty has been added to the house. As an illustration of this, we may refer to a noble plant of *Nymphæa cærulea*, which last year adorned Mrs. Lawrence's tasteful aquarium at Ealing Park. Of the loveliness of the species, it would be superfluous to give any description, but literally nothing is known of its beauty by growing it in a confined cistern. The specimen in question was apparently quite a young one, and far from being large; it had also been merely a short time planted, and could not be supposed to have attained its wonted luxuriance. Nevertheless, the leaves and flowers were, we believe, finer, and of greater dimensions, than we have ever seen those of *N. alba.*

We will not pursue this topic further at present, than to recommend that no aquarium be in future constructed without having two or more hot-water pipes to pass through the water, about half-way between the surface and the bottom. The basin may be of any form which will best agree with the plan of the house. It should, however, be as near as practicable to the centre of the structure, for the sake of symmetry and effect; while a circular, oval, or any proximate figure is the most beautiful; but if the extent be great, these must not be admitted, since it is requisite that all parts of it can be easily reached. Slate or stone are in all respects preferable for composing it to stuccoed bricks; and where the design and dimensions will at all admit of it, the basin ought to be raised two or three feet above the floor of the house, that the plants may be brought into closer proximity to light, which is of essential service. Failure will undoubtedly be experienced to a greater or less degree, if care be not taken to supply the cistern with water from a pond, river, or other exposed spot where it can be obtained *soft*, and not from a spring.

RECEPTACLES FOR ORCHIDACEÆ.

It is impossible to enter any of the British stoves, in which Orchidaceæ are extensively and aptly cultivated, without being struck with the surprising effect, either pleasurable or annoying, which the receptacles in which they are grown immediately produce. If the eye encounter a collection of suspended plants, disposed in the most irregular manner, on the greatest diversity of blocks, baskets, and prepared earthen or other pots, a delightful sense of congruity and naturalness is excited, and a very grateful feeling ensues. But should the arrangement border on formality, the materials be nearly uniform, and the shape of the receptacles incline to one common type, however appropriate, an emotion of a directly converse nature will be experienced.

Such being the obvious, and, we think, indisputable influence of so seemingly trivial a circumstance, it becomes the duty of the cultivator to inquire, how it may be directed into an agreeable channel, and what are the sorts of receptacles which will best, generally, answer the purpose of supporting and displaying the individual plants; of concealing and counteracting, as far as practicable, the artificial appearance they must, in some degree, assume; and of composing, when associated, an interesting and alluring whole.

Here, however, another question arises. What may be most pleasing to the eye and conducive to the enchantment which results from a well-adjusted combination of such grotesque and fanciful objects, is not, probably, adapted to the actual exigencies of the plant to be placed in it; and a necessity is, therefore, superadded for taking into account the habits of the species, and even, in particular cases, the condition of the specimen.

Happily, the habits of Orchidaceæ are mostly generic, that is to say, one species of a genus may usually be regarded as a counterpart of the whole, with reference to culture; and there are, further, many *genera* which may be classed together in a system of treatment. The great groups of epiphytal and terrestrial form the principal divisions; still, although well defined as to natural character, it is notorious that, in practice, not a few of the epiphytes thrive better when planted in a suitable *earth.* The most palpable distinction between them is, that the ground-rooting species require a friable common soil, of which loam is the chief constituent; while those epiphytes that will luxuriate in earth, demand a peculiarly fibrous and turfy heath-mould, preserved in lumps of various sizes, and interspersed with plenty of potsherds.

Of the epiphytal class, again, those needing an earthy compost, are invariably of the pseudo-bulbous description, or furnished with bulb-like, short, swollen stems, above the surface of the ground; the roots of these being descending, and their habit insufficiently wild and curious to allow of their being treated as pure epiphytes.

It is the caulescent species, or such as have ordinary ascending or drooping stems, with, in most instances, tortuous aerial roots, that most thoroughly adapt themselves to suspension on blocks, or attachment to branches of trees.

In consideration of the differences thus pointed out, three varieties of receptacle or support have to be provided. First, pots for the terrestrial and some of the pseudo-bulbous epiphytal species; secondly, baskets for other pseudo-bulbous kinds, such as Stanhopeas, whose mode of flowering renders suspension necessary, and pots unsuitable, and for numbers of the caulescent Dendrobia and the like, which grow to too great a size, or have too tender roots to be properly sustained, or to bear exposure, on blocks; and, thirdly, logs of wood for the tribe allied to Vanda, whose roots are strong, capable of subsisting in a moist atmosphere alone, and of enduring the same circumstances as the stems and leaves, without injury.

Cultivators have, at different periods, attempted to supersede the use of common clay garden-pots for Orchidaceæ, and substitute some made of a more porous material, with a rougher surface, to which the roots could more readily affix themselves. Experiments of that kind have, however, as far as we are aware, all proved futile, and the old clay pot is yet universally employed. It is singular that one of the deficiencies which those trials were intended to supply has not been otherwise obviated, and that the sides as well as the bottoms of pots prepared for Orchidaceæ are not freely perforated with holes, from a quarter to half an inch in diameter. The soil would thus be penetrated more completely by air, and excessive dampness would be effectually prevented.

But if it be strange that some such contrivance as the above has not been adopted, it is still more inexplicable why shallow pots have not been manufactured expressly for these plants. The inconvenience of deep pots is strongly felt by all, and an extra one is usually wasted to invert in the bottom of the other; when the same end could be gained far more easily and satisfactorily by using the broad flat pans, (or some of a like form,) in which seeds are mostly germinated, and propagation is ofttimes performed. It appears to us, that when the art of pot-culture is brought to a higher state than at present, shallow pots will be in general requisition; and everything is in favour of their adoption for Orchidaceæ.

Baskets for the epiphytal species may be constructed in a multitude of ways, and of the most varied figures and materials. No metallic substance should, however, be employed, that has a tendency to rust; and paint must be expressly prohibited, either for improving or preserving, in every case. Copper-wire will constitute a light and elegant frame for Stanhopeas, but it ought not to be of a hemispherical form, nor plain round the upper margin, or it will look more like a rat-trap than an ornamental receptacle for plants. For the species whose foliage is of a lively green hue, Messrs. Loddiges have introduced a very pretty receptacle, composed of large cockle-shells, fastened together, in several shapes, by simply piercing them near the edges, and tying them with strong copper-wire. The upper or under surface of the shell can be turned outside at pleasure; since, by this means, as well as by using a few of the lower halves, (the upper being generally chosen for its greater concavity and beauty,) a pleasing variety can be obtained. Other baskets, formed of oak or hazel billets, about an inch apart, and of an equal thickness, united by strong wires passing through them at the ends, can be either square or of a similar outline, but gradually contracted from the top to the bottom ; or of an inversely pyramidal figure; with the bars projecting at the upper and lower corners to vary them a little, or cut off quite level. Baskets of wicker-work, whether the twigs be entire or split, are not to our taste. Pieces of wood, with several natural forks to them, admitting, in the hollow these compose, a sufficiency of earth or moss, are picturesque and natural, and may be sparingly introduced.

For logs, on which to fix the strictly epiphytal kinds, some doubts are usually entertained as to the most proper wood for them. It seems now agreed, by the London cultivators, that blocks of the *Robinia pseud-acacia* are the most suitable. Oak logs, Messrs. Loddiges find to give out a strong and detrimental astringency, though they probably do not hurt all species alike, and to none do they occasion serious detriment. In choosing pieces of wood for the object, the roughest, most rugged, and singular should have the preference, as their aspect is most congruous, and the roots love to hide in the crevices. They ought not all to be suspended in one direction, but a few lie horizontally and others hang perpendicularly. Where large branches are employed, unless the forks of them are fully two inches or more in thickness, it will be better to cover them with moss; for weak thin twigs have a puerile, toy-like appearance. Old pieces of basket, flat wicker-work, or anything slovenly, can never be admired. Neatness should not be sacrificed to novelty.

Decidedly the best logs we have yet seen, were some portions of cork-branches, two feet thick, at Mr. Knight's, Chelsea; and if these could be procured with facility, and were found to possess no hurtful astringency, we should not desire a fitter material. Strips of cork bark, suspended flatly at the same establishment, are too artificial; and to masses of baked potter's clay, made rough on the exterior, a like objection strongly applies. The secret of imparting interest to any group of these supports, is to vary their forms and positions as much as possible, and to exclude everything that indicates contrivance, art, or skill.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MAY.

Bomàrea acutifòlia ; *var.* punctàta. A handsome variety of a plant better known as *Alstrœmeria acutifolia.* It does not differ from the species, except in having yellow petals, which are slightly spotted, within its reddish sepals; the habit being climbing, and the leaves broadly lanceolate. Its native country is also peculiar, T. Harris, Esq., of Kingsbury, having imported it from Caraccas, while the species is of Mexican origin. It blooms in clusters, from the ends of the shoots, during the latter part of the summer. *Bot. Mag.* 3871.

Cobœ̀a stipulàris. Allied to the old *C. scandens*, and similarly remarkable for the rapidity of its growth, thus being well adapted for speedily covering a blank wall in the summer. Like *C. scandens*, it has large, bell-shaped, greenish-yellow flowers, which are stained with purple, and the chief feature about the leaves is that they are often found in the state of broad, kidney-shaped stipules. Mr. Hartweg introduced the species from Mexico to the Horticultural Society, in whose garden we observed it flowering last season. It succeeds as a half-hardy herbaceous plant, or conservatory climber, and may be either increased by cuttings, or treated as an annual, and multiplied by seeds in the spring. *Bot. Reg.* 25.

Cœlógyne Cúmingii. One of the beautiful orchidaceous plants brought by Mr. Cuming from Sincapore to Messrs. Loddiges. To *C. trinervis* it is closely related, but that plant is "readily known by its very long, narrow leaves, its shorter bracts, smaller flowers, and much shorter middle lobe to the lip." The pseudo-bulbs are small, the leaves in pairs at their summit, and five-nerved; while the blossoms are produced sparingly on an erect raceme. They are white, and the lip has a lengthened intermediate lobe, which is yellow in the centre, and has three elevated ridges, of which the middle one is the shortest. *Bot. Reg.* 29.

Cròcus Adámicus. Assigned, by the Hon. and Rev. W. Herbert, to a section called *annulatus*, on account of the permanent rings which sheathe the base of the bulbs. It is a pretty purplish, or lilac-coloured species, with a yellow centre to its flowers, and bearing them early in the spring. Specimens were received at Spofforth from Mr. Gay, who obtained it from Tauria. We believe it is perfectly hardy. *Bot. Mag.* 3868.

Hæmánthus tenuiflòrus ; *var.* Mozambicénsis. Described as a very splendid bulbous plant, producing, in the beginning of last April, "upwards of a hundred flowers, the head becoming almost spherical, in the stove at Spofforth, where it had stood the whole year in a hot situation, having been left dry through the winter." The bulb was imported from Mozambique to Rio Janeiro, from whence it was procured by the Hon. W. Fox Strangways, and forwarded to Spofforth. It is very like the variety from Delagoa Bay, but the tube of the flowers is half as long again. The blossoms are of a deep red hue. *Bot. Mag.* 3870.

Impátiens rósea. Decidedly the neatest and prettiest of the numerous Himalayan Balsams that has yet been figured. It is an annual species, by no means so rambling or luxuriant as most of its recently-introduced congeners, with pubescent stems, long, narrow, serrated foliage, and a cluster of lovely, rosy pink blossoms in the axils of the leaves. The whole of the back portion of the flowers is much the darkest. The seed-pods are conspicuously clothed with a whitish woolly substance. It can be managed as a tender annual, and kept in the greenhouse. Seeds were given to the Horticultural Society by the Court of Directors of the Hon. East India Company. *Bot. Reg.* 27.

Lœlia acuminàta. A native of Guatemala, where it was found by Mr. Hartweg, growing on the trunk of the Calabash-tree, and generally producing a corymb of seven or eight charming flowers. Plants, however, that have flowered in three English collections, have only borne two blossoms, and hence its extreme beauty is only known by dried specimens. It is most like *L. rubescens*, from which it "differs in its larger wrinkled pseudo-bulbs, larger and more corymbose flowers, and in the different form of the labellum." The blossoms are of a delicate blush colour, becoming purplish towards the interior, and having a tinge of yellow in the lip. It will no doubt thrive best on a block of wood, kept in a cool dry house in winter. The delightful and fragrant flowers appear in December and January. *Bot. Reg.* 24.

Posoquèria versícolor. At first called *Oxyanthus versicolor*, but now published under the present appellation. "With Oxyanthus it corresponds in the absence of hairs from the throat, and in the long filaments; with Posoqueria in the oblique corolla; from Oxyanthus it differs in the latter circumstance, from Posoqueria in its naked throat and very prominent anthers." After all, Dr. Lindley considers the essential characteristic of Posoqueria is its oblique corolla, and hence, that this species belongs to that genus. It is a fine stove shrub, with very long, pendent, sweet-scented blooms, which are first white, then pink, and finally rich crimson. We saw it blooming at Messrs. Loddiges in August, 1840; and these gentlemen imported it from Cuba. *Bot. Reg.* 26.

Sprekèlia cybíster. This singular plant was added to British collections from Bolivia, by Mr. Knight, of the King's Road, Chelsea. The changes in the figure and position of its germen, and the disposition of the outer segments of the perianth, are very peculiar. The flowers are elevated on a strong stalk, being partly pendent, crimson, tipped with green. "The leaves do not appear till after the flowers are passed, or if the point of a leaf appears, its progress is suspended. The plant likes rich alluvial loam, and should be left dry in the winter in the greenhouse." It flowers in the month of April, if treated as a greenhouse species. *Bot. Mag.* 3872.

NEW OR BEAUTIFUL PLANTS RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES.

Chorozèma spectábilis. Dr. Lindley has applied this name to a Swan River plant which has bloomed in the Horticultural Society's garden, and more than one nursery establishment, and which seems to be nothing more than a slightly superior variety of *C. rhombea.* The difference (if there be any) is in the brighter colour of the flowers, and the shorter and broader leaves of the plant whose appellation heads the present notice. It may be worth mentioning, however, that a specimen planted in the elevated pit of a warm greenhouse at Messrs. Rollisson's, grew so much more luxuriantly, and flowered in such amazing prodigality, that those who have not seen the plant in the like circumstances have no conception of its beauty.

Cinerarias, hybrid. Messrs. Henderson, of the Edgeware Road, to whom amateur cultivators owe a debt of gratitude for the many splendid hybrids they have obtained from the genus *Cineraria*, (or *Senecio*,) have this year a number of other novelties in flower. Of these, there are some which must be considered improvements on the King, Waterhousiana, &c., while the splendid blue or bluish-flowered varieties, with one whose blossoms are of so intense a crimson that it is difficult to gaze on them without having the eyes affected by their brilliancy, are rightly regarded as the best in the collection.

Èria bractéscens. As the name indicates, the distinguishing characteristic of this species is the large bracts, which, from their purplish hue, give a showy aspect to the plant long before the flowers are opened. It is of vigorous growth, with pseudo-bulbs which are continuations of a rising rhizoma, and blossoms that are in no degree striking. Messrs. Loddiges imported it from Sincapore, and flowered it last month.

Èria longilàbris. A far more valuable species than the foregoing; and lately bloomed in the same nursery. The stems are long, thick, and not much unlike those of *E. densiflora*, though larger. The flowers appear in extensive, nearly upright racemes from the tops of the stems, and are white, with a peculiarly elongated lip, which is stained with purple. Altogether the plant is the most ornate member of the genus.

Gentiàna vérna. We cannot deny ourselves the pleasure of recommending this diminutive but decided native gem to all who do not object to cultivating plants solely because they are indigenous to their own country. Its lowness, and the intense blue of its lovely flowers, give it strong claims on the possessors of rockeries, or of small flower-beds for dwarf rare plants. It may be procured of most nurserymen who grow Alpines, and has just shed its flowers. A variety with whitish blooms has likewise flowered at Messrs. Young's, Epsom, and creates a gratifying contrast.

Maxillària aromática, *var.* Mr. Knight, of Chelsea, has latterly succeeded in flowering a very excellent variety of *M. aromatica*, of which the pseudo-bulbs and leaves are finer, and the flowers are considerably larger, besides being of a superb golden colour, with more markings of brown in the lip.

Maxillària citrìna. In the habit and leaves this new species is something like *M. stapelioides*, and the flowers are also produced solitarily, on short peduncles. The blossoms are, however, of a yellow colour, with a very few spots in the middle, and the lip is differently formed. It is a pretty little species, and is blossoming with Messrs. Loddiges.

Oncídium longifòlium. Allied to *O. Cebolleti*, from which it differs in being far stronger in all its parts. The leaves, which are unusually lengthened, have a curious habit of partially twisting themselves and turning downwards, when they arrive at a certain age. The flower-stem is very luxuriant and spotted, and the flowers are copious, yellow, blotched with brown; the lip and appendages being entirely yellow, save a little brown near the base. It flowered, six weeks back, in Messrs. Loddiges' orchidaceous-house.

OPERATIONS FOR JUNE.

Most of the flower beds and borders being now thoroughly filled, and all tender exotics that had been prepared for the open ground transferred to their proper position, it is to be desired that a vigorous growth may forthwith commence. To promote this, unless the season be more than usually wet, frequent waterings will be requisite; and as all other plants may be said to demand the greatest quantity of water during the present month, a few remarks on the practice of watering will not be misplaced.

One of the first principles to be observed in the application of water, is not to flood the ground on which it is poured, nor to supply it so rapidly, or so copiously, as to create pools or puddles on the surface of the earth. The immediate effect of any such process may be witnessed in the case of heavy rains. When the water descends with a violence and precipitancy sufficient to occasion a general pool on the face of the soil, it invariably follows that, if a hot sun ensue, the surface is hardened into a concrete crust, which must be disturbed and broken before it will again become pervious to moisture. In the case of artificial watering, precisely similar results attend an equally abundant irrigation. Hence, it is to be recommended that, where practicable, each plant should be watered individually from the spout of a pot, and no rose employed except in the case of seed-beds.

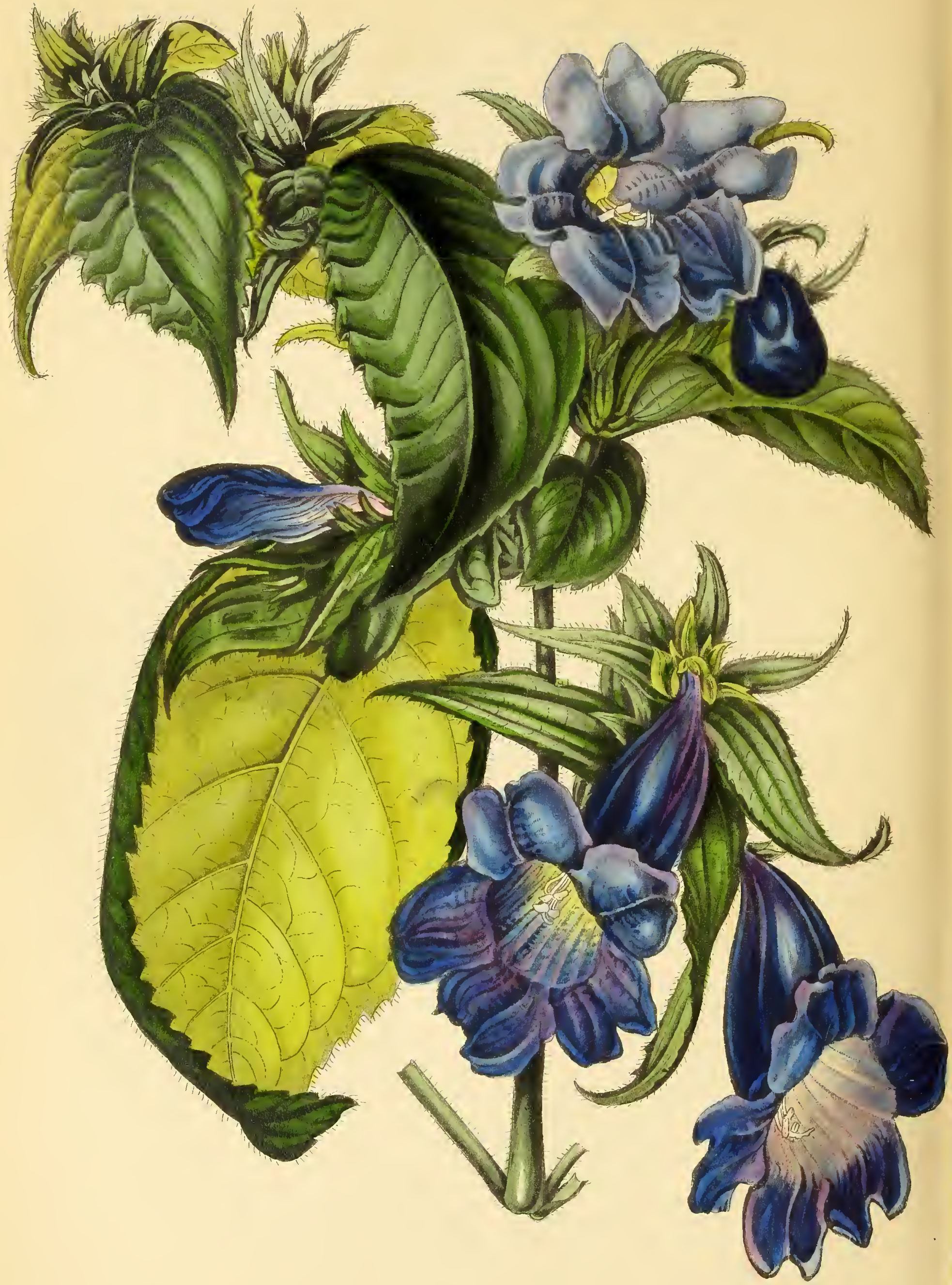
Plants in pots are particularly liable to be affected by receiving their water through a rose, especially if they have to be much exposed to solar influence. We have before us some specimens that have almost perished from being watered, directly after potting, through a coarse rose. The top of the soil at once became a solid and impenetrable mass, it broke away from the sides of the pot, in which channel all the water that was subsequently given directly found its way to the bottom, without ever reaching the centre of the balls. Had not this been discovered, and remedied by stirring the surface soil, the plants would have inevitably died in a few days. The culturist should, therefore, not only abandon the use of a rose for general purposes, but be constantly on the watch to detect when the passage of water throughout the whole mass of earth is in any way deranged.

As the orchidaceous-house is now adequately heated by the sun during the day, fire-heat may properly be withheld for a season; since it is not at all desirable to have a high temperature through the night. To retain, however, a moderate heat, the house should be closed towards five or six o'clock in the afternoon, and at this time the plants can be freely syringed with water. From the general geniality of the atmosphere, it might be imagined that this is the best period for transferring to the drawing-room those Orchidaceæ that are in flower. But this is a mistake. Plants actually growing in a warm humid house will not bear to be removed suddenly to a cool dry one; so that it should not be attempted unless the specimens have perfected their young shoots. Shade, throughout the day alone, must be continued; but it cannot be needed at night.

Although many turn out part of their greenhouse plants into the open air in May, and some have even exposed them in April of the present year, it is not well to do this till the beginning of June, particularly in northerly districts. They should never be placed where there is not a solid bottom for the pots to stand upon, on account of the worms which would enter the pots from a lighter material. A mulching of some kind, or the simple spreading of a little moss amongst the pots, will be beneficial, for it is through the roots becoming scorched or parched that such plants are usually injured, and not so much by the action of the sun on their leaves. Heaths ought particularly to be attended to at the present time; for many are killed solely for want of water in the summer.

The kinds of Cactaceæ that have ceased flowering should be encouraged to grow freely, by liberally watering them, and, with the stronger species, by the occasional use of manure water. A little heat and a moist atmosphere will further be serviceable. Pelargoniums, which have bloomed early, may be cut down, their roots trimmed, and planted in smaller pots, to be again excited to growth.

Transfer unhealthy greenhouse shrubs to the open ground; keep climbers of every sort well trained, and within due limits; sow and transplant annuals; repot Cockscombs, Balsams, and other rapid-growing plants as they require it; stake Dahlias, Hollyhocks, Chrysanthemums, &c., when they get more than six inches in height; clear off insects as speedily and as effectually as possible by the ordinary means; plant cuttings of laurels and similar evergreens; propagate exotic shrubs to the requisite extent; plunge Alpine plants that happen to be in pots to the rim, in cool situations; put in cuttings of pinks; and impregnate flowers that are wished to be hybridized, as well as collect seed from those bearing it.



Goldfussia glomerata.

GOLDFÙSSIA GLOMERÀTA.

(AGGREGATED-FLOWERED GOLDFUSSIA.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMIA.

NATURAL ORDER.
ACANTHÀCEÆ.

Generic Character.—*Calyx* five-parted, nearly equal. *Corolla* funnel-shaped, with a five-parted, obtuse, equal limb. *Stamens* included, didynamous, lower ones often very much the shortest, reflexed. *Anthers* changing; cells in the connective hooked, glandular, oblique, ovate, membranaceous. *Stigma* simple, awl-shaped, sometimes indistinctly crenated. *Capsule* hexangular, with a two-valved, easily-loosened dissepiment; cells two-seeded. *Seed* discoidal.

Specific Character.—*Plant* shrubby, evergreen. *Stems* much-branching, a little swollen above the joints, hairy. *Leaves* ovate, acuminate, usually a little unequal; green, and covered with long white shaggy hairs on the upper side; whitish, with much fewer hairs below; crenate at the margin. *Flowers* in scattered heads, very large, deep blue.

Only one species of *Goldfussia*, besides that at present figured, is generally cultivated in British gardens, and this, though it properly bears the name of *G. anisophylla*, is much more familiar under the appellation of *Ruellia anisophylla*. It is a pretty stove shrub, easily cultivated, branching freely, with smooth unequal leaves, and remarkable for the profusion in which it produces its pale, bluish white blossoms, and for the great length of time through which these continue to expand.

G. glomerata is widely different from *anisophylla* in the strength and luxuriance of its habit, which, by consequence, is necessarily rather more diffuse; in the greater size of its foliage, which is nearly six times as large; in the prominent shaggy hairiness of both branches and leaves; and the highly increased dimensions, as well as far intenser hue, of its very handsome flowers. These last are, further, not so scattered as those of the old species, and are collected together in loose heads near the extremities of the branches, a quantity of smaller leaves usually surrounding them.

Not having been in the country more than three or four years, it is yet rare in collections. We believe it was originally introduced by His Grace the Duke of

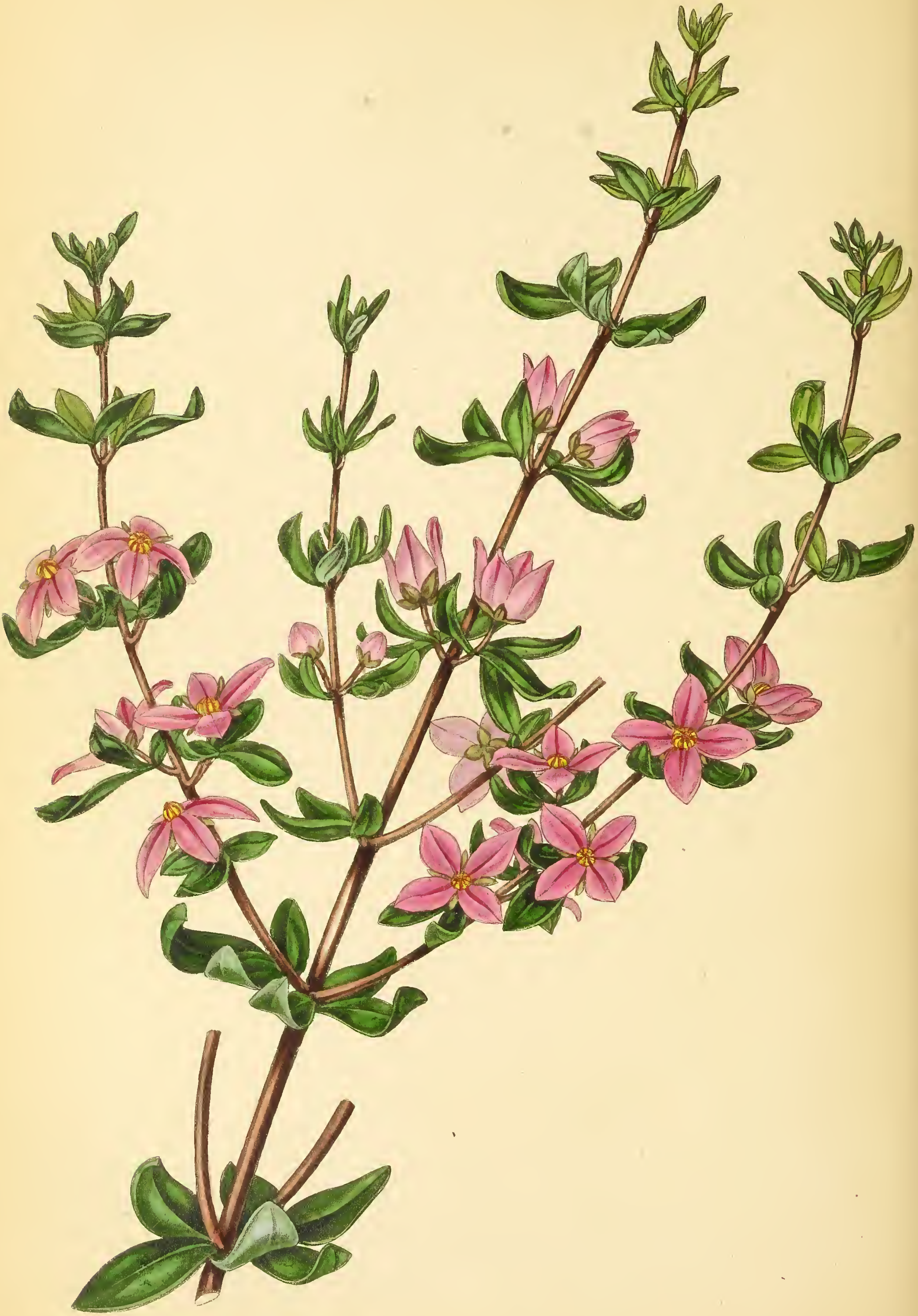
Northumberland from Silhet, in the East Indies, to the gardens at Sion House. The first flowering plant that we saw was in the stove of Mrs. Lawrence, Ealing Park; where, under the skilful tendance of Mr. Butcher, a large specimen, from which our drawing was liberally allowed to be taken, flowered richly in 1839 and 1840. Like *G. anisophylla*, it is extremely prodigal of blossoms, some of which are commonly developed throughout the principal part of the year, though the autumnal months are the chief flowering season.

Its cultivation is unattended with any difficulty. A warm damp stove is at all periods necessary to its perfection; for it is not a plant that loses its leaves, or ceases to advance, during winter; the flowers being continually unfolded from autumn to spring. The ordinary compost used for stove plants will be sufficient for this. A mixture of loam and heath-soil, lightened with a little sand, is a good medium; and it may, with propriety, be enriched with a small proportion of well-reduced leaf-mould or manure, on account of the vigorous character of the plant.

In potting, it should be seen that the outer roots are not too far removed from the sides of the pots, and the plants ought again to be shifted, as they require it, as soon as the roots reach their limits, or appear through the hole at the bottom.

Propagation is performed by cuttings, which are fit for removal at almost any season; but the spring months will be found the best period for the operation. The cuttings should be taken off just below a joint, from which the leaves are to be cut (and not torn) away. They will root in any moist temperature, if duly covered with a hand-glass, and shaded.

Goldfussia was so named in honour of Dr. Goldfuss, a professor of natural history at Bonn on the Rhine. The specific name alludes to the collected arrangement of the flowers, as compared with that of *G. anisophylla.*



Boronia [illegible]

BORÒNIA LEDIFÒLIA.

(LABRADOR TEA-LEAVED BORONIA.)

CLASS.
OCTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
PROTEÀCEÆ.

GENERIC CHARACTER.—*Calyx* four-parted, or four-cleft, permanent. *Petals* four, marcescent. *Stamens* eight, the four opposite the petals shortest, all shorter than the petals, free, fringed, or tubercled, linear, usually dilated at the top, whence a very short thread rises, bearing the anther. *Anthers* heart-shaped, usually with a short appendage at the apex. *Styles* four, erect, smooth, approximate or joined together, terminated by an equal or capitate four-furrowed stigma. Fruit of four two-valved carpels. Seeds ovate, compressed, usually one in each carpel. *Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* an evergreen shrub, from two to three feet in height, branching freely. *Leaves* linear-lanceolate, entire, appearing in groups or partial whorls, small, downy below. *Flowers* axillary, solitary, four-sided when in the bud state, large, conspicuous, pink.

ALL the species of *Boronia* are more or less interesting, and attract attention from the neatness of their growth, and their pretty pink blossoms. Their dwarfness and compactness peculiarly fit them for greenhouse culture, and for growing in pots; as they can be placed on any kind of stage, and will, if judiciously treated, bear to be exposed to view on all sides.

B. serrulata is perhaps most prized on account of the freedom with which it branches, the denseness and pleasing light green hue of its foliage, and the prodigality of its deep and lively pink flowers. *B. crenulata*, a newer and scarcer species, is more rigid in its habit; the leaves take a direction more parallel to the stem, and are of a darker and duller green; while the blossoms are smaller, less aggregated, and not quite so showy. It is, however, an ornamental little plant. *B. pinnata* and *denticulata* belong to a very different group; their leaves being much divided and slender, and the flowers light rose-coloured.

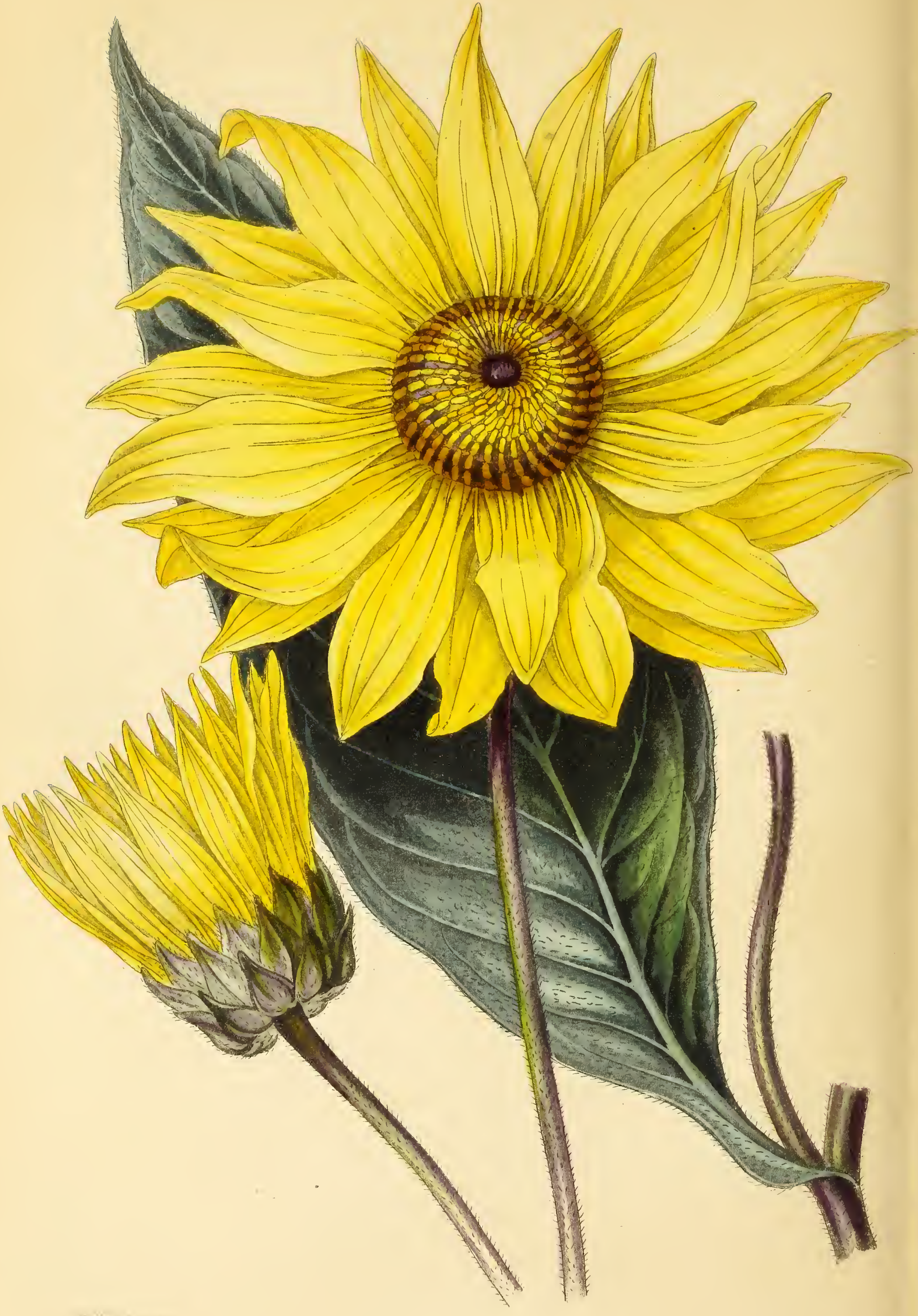
B. ledifolia approaches both these classes in some respects, but it is separated from each in several others. Like *B. serrulata* it has entire leaves, and as in *B. crenulata*, there is a tendency to rigidity and straightness in the branches; yet the foliage is in distant bunches, and not so regularly disposed as in the former plant; and the stems and branches are considerably stronger, the latter being likewise more spreading, than those of *B. crenulata*. It may be added that the leaves are without any of the notches peculiar to each of those species. To *B. pinnata*, again, there is a resemblance in the size, general character, and colour of the flowers; these being nevertheless of a more expansive kind, and rather richer hue.

Such, then, is the relative position of this species, with regard to its congeners. A more abundant supply of foliage would probably render it additionally ornamental; but when in flower, the astonishing profusion of its blossoms prevents this defect from being noticed, and in the absence of flowers it is not at all conspicuous. Altogether, it is entitled to a high place in the esteem of the cultivator, and at the time we observed it blooming with Messrs. Loddiges in April last, the symmetry and beauty of the plant, so copiously laden with its charming inflorescence, were particularly striking.

Messrs. Loddiges imported from New Holland, many years ago, the seeds from which their existing stock of this plant was obtained. We learn from the catalogues, in fact, that it has been in England since the year 1814. Plants have not, as far as we can gather, flowered freely previous to their development at the establishment above noticed, and our figure was made at the period just mentioned.

It may be associated with the allied species in reference to its management. The soil must not be very nutritive, and sandy heath-mould should be the main constituent; elevated slightly, moreover, in the middle of the pot. One third of light loam will, however, be requisite. Special care should be taken not to put the specimens in a pot of too great a diameter, and to water them at all times with caution; since no plants suffer more from drought or saturation. Cuttings, treated in the ordinary way, will root soonest in the month of May or June.

The genus commemorates Francis Borone, an Italian servant of Dr. Sibthorpe, for having collected a great number of botanical specimens. He was accidentally killed at Athens. The term *ledifolia* refers to the similarity of the leaves to those of the common species of *Ledum*.



Pascalia glauca

PASCÀLIA GLAÙCA.

(GLAUCOUS-LEAVED PASCALIA.)

CLASS.
SYNGENESIA.

ORDER.
SUPERFLUA.

NATURAL ORDER.
COMPÓSITÆ.

GENERIC CHARACTER.—*Capitulum* many-flowered, rayed; radial flowers strap-shaped, female, in one row; those of the disk hermaphrodite, tubulose, five-toothed. *Involucrum* equal with the disk; scales arranged, for the most part, in two rows, linear, subfoliaceous. *Receptacle* nearly convex, paleaceous; scales lanceolate. *Achenium* of the ray three-sided, involucral scales not included; that of the disk four-sided, obovate, scales partially included. *Pappus* crown-shaped, very short, irregularly toothed.

SPECIFIC CHARACTER.—*Plant* an herbaceous perennial, growing from three to four feet in height, branching but little. *Leaves* opposite, linear-lanceolate, entire, covered with little bristles; lower ones irregularly toothed. *Head of flowers* terminal, solitary; radial flowers large, yellow.

YELLOW flowers are, as we have before been led to remark, far from being favourites with the majority of floriculturists. The force of association is so powerful, and they have so long been accounted emblems of a not very amiable emotion, that a prejudice exists, in the minds of many individuals, against the whole of the tribe.

No such narrow or puerile views ought, however, to influence the cultivator in depriving his collection of some of their greatest ornaments; which, it must be confessed, are to be found amongst the plants bearing blossoms of various shades of yellow. Nor should a trifling similarity to the oldest and commonest of our border decorations be allowed to determine, for a moment, the exclusion of objects in themselves both rare and beautiful.

Unquestionably a first sight of the fine perennial represented on the opposite page recalls vividly the universally known annual Sunflower; and the observer feels tempted to pass it by for that resemblance, without even asking its name. But, admitting the apparent approximation in the form and colour of the flower to that of the plant referred to, there is an elegance of character in the stems and leaves, a gracefulness and length in the flower-stalk, and a certain style of beauty about the buds and flowers of the Pascalia, which are not to be met with in any of the Sunflowers.

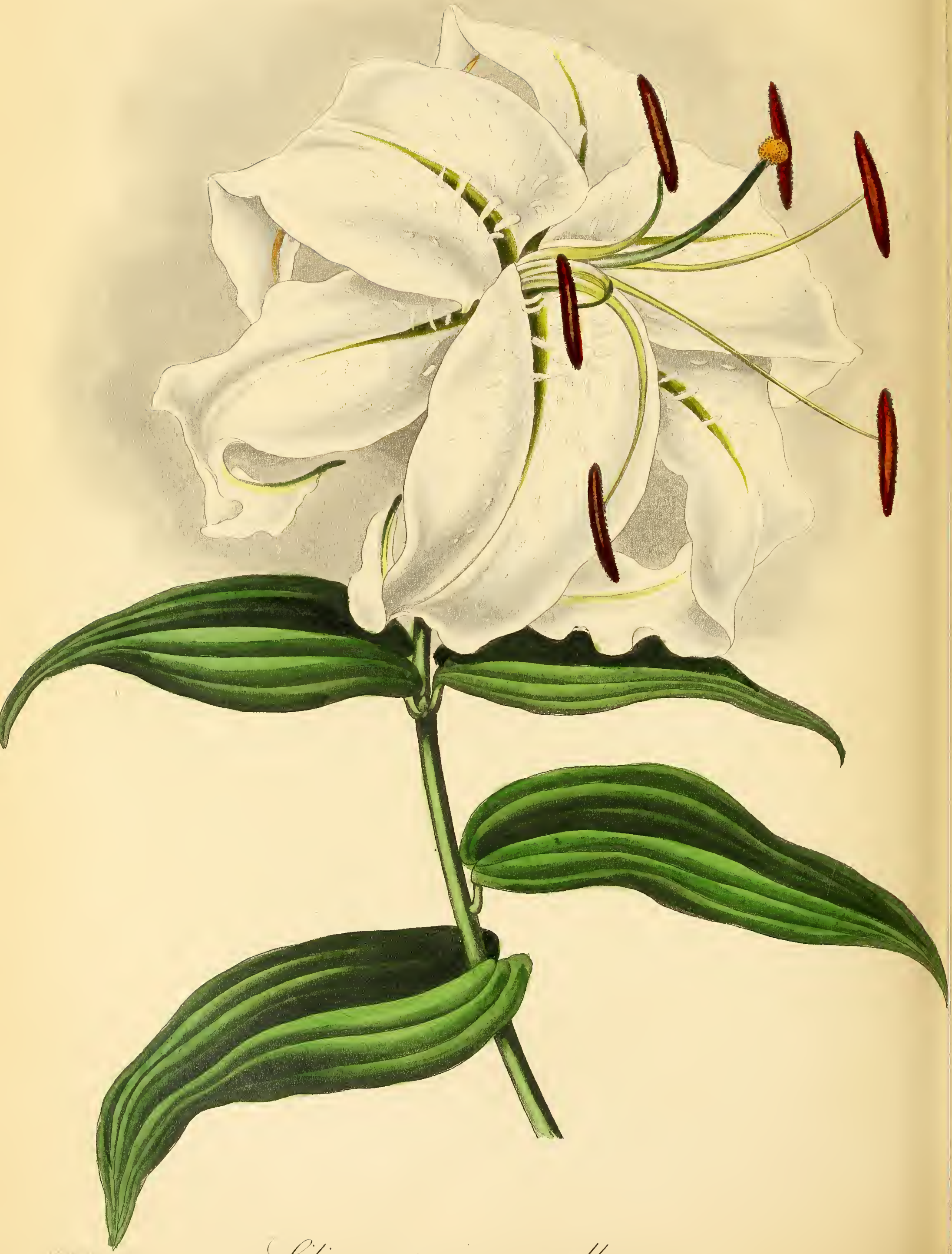
P. glauca, the only species yet introduced, was brought to this country from Chili between forty and fifty years ago. Probably owing to its similarity to *Helianthus*, and possibly, also, from its being a not very robust plant, it has shared the fate of numerous other specious productions, and been thrown almost entirely out of cultivation. Having casually noticed it last year, in the nursery of Messrs. Young, Epsom, and felt assured that it was a border plant, of which few know anything, but with which all should cultivate a better acquaintance, we had the accompanying figure prepared.

The species has one or more stems, which are not particularly strong, growing about three feet in height, and from which four or five branches are protruded, each surmounted by a single flower. Both the stems and the shoots are of a dark purplish colour, and, as well as the leaves and involucrum, are covered with hairs. The flowers begin to open towards the end of June, and there are often some remaining in September.

The mention of its native country, Chili, will suffice to show that it is not thoroughly hardy. At least, in severe winters, it is desirable to protect it, by a mulching of old bark, or a wooden covering, or an inverted garden-pot, from extreme wet or frost. It flourishes in any loamy soil that is open and slightly nutritive; an adhesive, sterile, or exceedingly rich earth being inappropriate.

It may be reproduced by dividing the roots in the spring months, shortly before it begins to grow.

Ortega formed this genus in compliment to Dedan Pascal, M.D., a professor at Parma.



Lilium speciosum album.

LÍLIUM SPECIÒSUM; *var.* ÁLBUM.

(WHITE-FLOWERED SHOWY LILY.)

CLASS.
HEXANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LILIĀCEÆ.

Generic Character.—*Perianth* campanulate, six-parted, with a nectariferous furrow in the sepals. *Capsule* six-furrowed, valves connected with small fibres. *Seeds* compressed.

Specific Character.—*Bulb* scaly. *Stem* erect, from three to four feet high and upwards, branching, smooth. *Leaves* ovate-lanceolate, scattered, nervose, somewhat reflexed. *Flowers* terminal, varying in number, one on each branch. *Perianth* drooping; segments reflexed and folded, covered with little warty excrescences on the inside, rose-coloured, with dark red blotches.

Var. Album.—*Flowers* white.

No one can be acquainted with the many beautiful plants collected by Dr. Siebold in Japan, without awarding the preference to those lovely lilies which are now the pride of our conservatories. In regard to beauty and magnificence, they rank with the most splendid productions of nature; and *L. speciosum* and its varieties are perhaps superior to any of the others.

In his excellent Flora Japonica, Dr. Siebold thus speaks of two of these plants: "Among more than twenty kinds of lily brought by me from Japan to Europe, and deposited in the Botanic Garden at Ghent, are the varieties of *L. speciosum* now represented. To that with rose-coloured flowers, blotched with purple, I give the name of *L. speciosum Kæmpferii*, because it was the indefatigable botanist Kæmpfer who first made it known to Europeans. For the second, with pure white flowers, I preserve the Japanese name Tametomo, which it bears in its own country, in consequence of having been first brought by the hero from the Loo-Choo Islands, as the Japanese assert. The beauty and fragrance of the flowers of these two kinds rank them among the most magnificent of their genus. I should even say that *L. speciosum Kæmpferii* stood at the head of them all, if a variety of

L. longifolium which I have seen in Japan did not dispute the palm on account of its sweetness."

"The variety *Tametomo*, although it has pleased some botanists to make a peculiar species of it under the name of *L. eximium*, differs, nevertheless, only in its flowers being quite white, and the leaves rather more distinctly stalked. According to some of the Japanese botanists, it is found wild not only in the Loo-Choo islands, but also in the north of Japan; but it has perhaps been confounded with *L. japonicum*, which is often wild in those countries."

Whether the variety thus called *Tametomo* and that now figured are identical, we have no means of deciding. Certain it is that the plant which has crept into British nurseries with the title of *L. eximium* is much more nearly allied to *L. longiflorum* than *L. speciosum*.

This variety, which is more abundant in England than any other, though it has not the gorgeous colour of the species, is a most delightful plant, and its flowers are highly fragrant. Messrs. Lucombe, Pince, and Co. of Exeter, to whom we owe the present drawing, inform us that all the varieties were "planted out in the bed of their camellia house, and have thriven most luxuriantly. Indeed, they seem to be quite at home among the camellias, flourishing in the same soil and under the same treatment; and although there is every reason to believe that they would succeed well in a warm border in the open ground, still they are most appropriately placed in the camellia house, as their flowers, which appear in July and August, agreeably vary the monotonous effect of camellias at that season; whilst the dark green foliage of the latter sets off to great advantage the flowers of the lilies. A compost of sandy heath soil and rich sandy loam agrees well with them; and it is not at all uncommon for strong stems to bear five or more flowers." We have witnessed them with ten and twelve.

The sole objection to this mode of treatment is that the plants attain a greater height than is consistent with their beauty, and if grown in large pots, and the leaves kept always up near the glass, they will acquire a degree of dwarfness which adds much to their appearance.

In increasing these lilies, the best plan is to detach some of the outer scales of the bulbs, and plant them separately, towards the early spring, in small pots of light compost, or to grow the specimens vigorously, and wait for their natural multiplication by the formation of offsets. The last method may be preferable for the general culturist; the first for those who desire a large quantity.

OF GARDENING AS A SCIENCE.

NO. VI.

We have thus far followed Dr. Liebig in his leading principles of chemical philosophy, as applied to the nutriment of vegetables: his last great proposition we have seen to be this—that plants derive their nutriment chiefly from the atmosphere; during and by which process they purify the air, absorbing that gas which would otherwise so accumulate as to become destructive to every being endowed with powers of respiration.

The hypothesis is startling, because it impugns those ideas which have been entertained by us all respecting the source and channels of the nutrimental sap. It remains, then, to investigate a little more minutely *the agency of manures*, and to discover, if it be possible, or at least to obtain a glimpse of the effects which they produce upon plants in the different stages of their growth. By manure we wish it to be understood that we mean to express every substance, without any exception whatsoever, which is decomposable in soils, and capable of being resolved into the elements of water, (oxygen and hydrogen,) of carbonic acid, (oxygen and charcoal, or carbon,) and of ammonia (hydrogen and nitrogen).

We make no allusion to manure in its limited sense, as applied agriculturally, but look at it broadly in its most simple, equally as in its most complicated form; and therefore, to make a commencement, we refer for example to that most feeble of all substances employed by the gardener, now usually styled *peat*, but which was formerly called bog earth.

This black-greyish or brown soil consists chiefly of white silicious sand, mixed with varying portions of fern, bog-moss, (sphagnum,) heath-leaves, rushes, or similar matter, in a condition of progressive decay. We lately visited the country about Virginia Water, Sunning-hill, and the border of Berkshire, south of Windsor Forest; and saw masses of this weak, black earth, cut out of common grass land, and laid up in heaps to mellow. It is tempting to those who delight in what are termed the American tribes of plants to behold this store of native soil; but woe be to him who shall touch it in its pristine state, as it is thus turned up to light! Buried in the darkness of ages, swamped with water, and of a butyraceous, compact texture, it is incapable of affording support to any plant but the poor miserable herbage which pines upon its surface. Yet this crude earth is a mine of manure, and by the operation of air, light, and atmospheric electricity, it is meliorated, and becomes qualified to support all the hair-rooted tribes which now are the prime ornament of our best gardens. The nurserymen in that quarter, who are ignorant of chemical principles, say that their customers complain of the loss of plants, although they are at pains to procure the best true soil. But in what state do they use it? as fresh, of course, as possible; and the consequence is inevitable—" it burns every root it touches."

This "burning," which is a word of common parlance, is false in application, though correct in its apparent effects. Plant an Azalea in fresh bog, and in a few days the points, then the half of the leaves, become brown, the shrub ceases to grow, the leaves fall, and it perishes. But keep that individual soil during two seasons exposed to the weather, turning it occasionally, and the same species which would perish in it while fresh, now grow, and thrive luxuriantly.

This burning, then, is the effect of gaseous developments, produced by progressive decomposition of the redundant vegetable matter. In farm-yard dung, ammoniacal gas is copiously extricated; but in moor or heath-soil we are inclined to think that some neutral salt of iron exists, (the sulphate, perhaps, in many instances,) which is gradually decomposed, loses its acid, and becomes an innocuous oxide.

But this is a digression, though one which involves many curious phenomena—it is our object to show that, simple as is this soil of our heaths, consisting of little else than sand and a small portion of laborated *humus*, a heath, azalea, andromeda, or rhododendron, may grow in a pot of it for years, and never exhaust it of any portion of its black vegetable matter. If any discernible alteration take place, so far from it becoming more pale or sandy, the tint becomes darker, as if finely powdered charcoal had been added to it. We will readily admit that the plant will require fresh aliment and more space, but the change wrought in the old soil, whereby it is rendered improper for the plant, is not one of exhaustion. The vegetable adds to the soil, or rather it ejects into it substances which are fæcal and excrementitious, and which, consequently, cannot with impunity be taken up a second time into its organic tissue.

Now, if this weakest of soils lose nothing of its humus, is not the theory of Liebig substantiated by a fact which any gardener has it at command to observe and adduce?

Liebig has been accused of self-contradiction, and that too so recently as in the June number of the Quarterly Journal of Agriculture, page 105: it is said there is "a strange inconsistency between his various statements upon this subject" (*humus*) "as they occur in different parts of his work"—thus, at p. 19, "we are expressly told that plants derive their carbon *exclusively* from the atmosphere," and then at p. 47, "that the roots absorb, as their proper nourishment, the carbonic acid generated in the *soil* by the *humus*."

These apparent contradictions exist; but the critic has overlooked one primal fact of the hypothesis, namely, that the humus becomes the source of aliment to all germinating seeds and *young* plants during their first developments, *prior* to the expansion of leaves; but that subsequently, when the foliage expands, the leaves absorb the carbonic acid of the air, from which acid the woody fibre and all the peculiarly-organized products of the vegetable are formed, and that henceforward plants yield more carbon or humus to the soil than they take up from it. Here is no contradiction, though we may admit that the author, as is but too commonly the case, has written too discursively; and it every day becomes more apparent that soils are changed by cropping, but never exhausted. The earths proper—alumine, sand, lime, and oxide of iron—may be taken up, to a very small extent, in a state of solution in water, but they retain their qualities in the mass; the soluble salts of the soil—potassa, soda, their sulphates, nitrates, and muriates, or ammonia and its salts—these are the substances which vanish, and must be renewed by manures; and upon this subject our author has evinced great power and intelligence. We shall have occasion to enter upon this subject, and then will offer remarks on points which he has overlooked; but at the present time we urge our horticultural friends to examine strictly all the earths they employ before they plant in them, and at every shifting. By thus investigating, a person may soon satisfy himself that a soil becomes replete with specific odours; that its texture is changed, and its nutrimental power deteriorated, as respects the individual plant, while it becomes extremely congenial to another of dissimilar habit; but that in every case the soil rather acquires depth and intensity of tint than the contrary—that it loses little in bulk, which little may be safely referred to watering and solidification—and therefore that the *humus* has suffered no loss of bulk by the absorbent powers of the roots.

CULTURE OF FUCHSIAS.

The Fuchsia is now popularly regarded as everybody's flower; and its management is considered so extremely simple, that the most transparent tyro would deem himself insulted were his ability to cultivate it successfully called in question. Without wishing to disturb the equanimity of this class of readers, we venture to think that there are points in the treatment of the genus at present insufficiently known or profited by; and principally to throw a little light upon these, as well as, subordinately, to lay before the uninitiated a few general hints on the culture of a group of plants in which, with proper care, none need be fearful of failure, we here bring the subject under notice.

Except two or three of the newer species or varieties, Fuchsias very rarely make the splendid figure at horticultural exhibitions which was manifest five or six years back; the reason for which is, not that they have fallen in public estimation, or, having lost their novelty, are less frequently grown, but that cultivators have discovered the extraordinary beauty they attain when planted in the open border, or the bed of a conservatory, and have consequently abandoned the attempt to rear superior specimens in pots.

In speaking of this change of system, however, we must not be supposed to mean that to obtain large plants is the sole object of it. This can only be the case when they are placed in a duly-protected border; and even then, the greater luxuriance, and the increased size and profusion of the blossoms, are primarily kept in view.

The avoidance, too, of a considerable amount of trouble and uncertainty, is doubtless another of the desiderata realized by such a measure.

But before remarking further on the out-door treatment of this genus, we must touch upon the best method of growing some of the species in pots. The sorts which adapt themselves most readily to pot-culture, are *globosa* and its varieties, *conica*, *macrostemon* with its varieties, *excorticata*, *cylindracea*, *microphylla*, and *lycioides*. The numerous hybrids raised by cross impregnation amongst these species and *F. coccinea*, *gracilis*, and *tenella*, may be ranked in the above enumeration with regard to culture. These hybrids, indeed, have, by their striking beauty, almost supplanted their original parents; though *F. globosa*, at least, retains all the interest it at first occasioned.

Besides the foregoing species, and some of recent introduction which we shall hereafter name, many others are recorded in botanical catalogues, the actual existence of which at this time in Britain is somewhat problematical; and scores of appellations are to be met with in nurseries and gardens, which have been injudiciously applied to hybrids that have scarcely any or no distinguishing characters. For the most part, these assimilate so closely in habit to one or other of the preceding, that no peculiar attention is requisite. To retain these species in equal beauty and vigour year after year, the main circumstances to be taken into account are to renew them at the end of every three or five years, to allow their roots a sufficient space in the pots, and to take care that they are not stinted for water, or their tender rootlets scorched by the rays of the sun in the summer months.

Unless it be the special intention of the culturist to procure very tall specimens, or to train them in a particular manner, young plants are always to be preferred to old ones; chiefly because they bloom finer and more abundantly, and partly, likewise, on account of the ragged, rambling character which large specimens assume. Thus, both *F. globosa* and *conica*—the two most ornamental of the species—will, after about five years' culture, become straggling, degenerate, and be deprived of much of their healthy appearance. It may be stated, also, that their flowers lose that brilliant, lustrous hue which so greatly adds to their charms.

With the hybrid kinds, degeneracy is still more inevitable, and the necessity for providing a fresh stock every few years additionally stringent. Producing mostly larger blossoms and handsomer foliage than the species—such superiority being caused by nutritive soil, or other favourable conditions of cultivation—when their branches acquire an excessive hardness or woodiness, such as three or four years' growth will impart, their former strength is reduced, and they fall back into the state from which they sprung.

What contributes largely to promote a similar feebleness, both of foliage and inflorescence, and to give a starved, stunted aspect to the plants, is the neglect to shift them properly and timely into larger pots as they may require. And it is herein that the amazing difference between a potted plant and one growing in a free soil is rendered apparent. With the roots crowded together in too small a compass, restricted, by consequence, in their supplies of moisture, and, by lying near the outside of the pot, being exposed to too violent a degree of solar influence, Fuchsias can seldom be preserved in health through the summer, without being in some way or other shaded; which shade is unnecessary and injurious.

For obviating consequences of this description, the repeated shifting of the plants, as they advance in size, into pots of larger dimensions, is strongly recommended. The early period at which Fuchsias begin to develop their young shoots must further be noted in connexion with potting; for if they are not shifted directly they commence growing, the branches will contract a weakness from which they will not usually afterwards recover.

The soil in which Fuchsias are commonly potted appears to us to contain too great a proportion of heath-mould, and not enough nutrimental matter. A sandy open earth may be more porous, susceptible of perfect drainage, and less liable to saturation; but we never saw a Fuchsia killed with water that had not been otherwise grossly mismanaged; and it is well known that during summer they have to be watered two or three times, or even oftener, on each of the hotter days. The blossoms of these plants, sooner than those of almost any others, flag and wither when their roots are dry, and though they are restored by a renewed application of water, they speedily fall when once subjected to such influences. Altogether, then, we think a rich fresh loam, with but little sand, the fittest soil for Fuchsias; and we would add leaf-mould, or thoroughly rotted dung, in small quantities, where the loam is not naturally nutritive.

All endeavours to provide against drought will of course prove useless, in the absence of the most vigilant attention in administering water during warm weather. On those days when the sun is powerful, they demand liberal supplies at least twice, and frequently thrice. They should ever be watered from the spout of a pot held close down to the soil, and syringing will be of great service if effected towards the evening.

But we desire now to invite the deliberation of the culturist on a question that has not, as far as our cognizance extends, been previously mooted. It relates to the propriety of regularly pruning the dwarf species of Fuchsia. Like the low sorts of roses, they have buds throughout the whole length of their branches, though they are most thickly collected towards the base. If left to their natural course, those nearest the tops of the shoots will be first developed, and the quantity of nourishment they absorb will preclude any of the lower ones from expanding. Hence, the plants every year become barer at the bottom, and the dwarfness and bushiness which constitute one of their greatest attractions, soon cease to exist. Nevertheless, this is not a solitary evil; for, situated at the weakly extremities of branches, those protruded from them cannot be so strong as they would, had they been at the lower end, and a process must therefore be in operation which gradually debilitates the flowering part of the plant.

Now, by pruning the young year-old shoots to within two inches of the bottom, a greater number of vigorous buds would be emitted, the plant would be kept low, dense, and spreading, and its energies would be appropriately thrown into the nearest and most convenient channels. To defer this pruning, however, till the buds have begun to swell or burst, would altogether negative its effect, and cause irremediable mischief; so that whenever our suggestion is adopted,—and we would urge its importance on every grower of the Fuchsia,—the plants should be pruned immediately on shedding their leaves. If anything were wanting to demonstrate the value of the practice, it is furnished in the fact that those species which are usually cultivated in the open ground, and have their annual growth destroyed every winter, invariably form more luxuriant shoots in the ensuing season.

F. coccinea, *gracilis*, *tenella,* and perhaps *macrostemon*, are, of all the species, the most suitable for the external borders, from the readiness with which they emit suckers from the old stocks after being cut down by frost. The first of these has proved itself so hardy in the neighbourhood of London, that, during the last winter, plants have stood wholly uncovered in the borders, and are now flourishing in the most robust manner. The others, coming from the same country, are no doubt quite as capable of enduring cold, and the smallest protection for the roots will be found adequate to their preservation. Since they do not begin to flower till the month of July, they can hardly be employed for the beds of the flower-garden unless the spaces between them be filled up with early-blooming plants through the spring; as vacant, or virtually vacant plots, cannot be tolerated at so interesting a period of the year. Should the insertion of such auxiliaries not be consonant with the wishes of the flower-gardener, a quantity of Fuchsias may be kept in pots purposely for transplantation, and their flower-buds removed if they open too early. For the borders, there can be no objection of that kind, and whether singly or in masses, these plants create a display for three or four months which few other exotics can rival.

In the propagation of Fuchsias, those which produce suckers might be multiplied by detaching them in the winter, spring, or any convenient period; but the ordinary way of increase is by cuttings. It is better, however, where plants are abundant, to make use of slips, or the lower parts of the young shoots, pulling them off carefully so as not to damage the branch on which they are growing. After cutting (not plucking) off the lowermost leaves, and reducing the shoots in length if needful, they can be planted in a light sandy loam at the foot of a south wall, and a hand-glass placed over them, which must be shaded through the day. The glass should be kept close, save while watering, for a fortnight or three weeks, when the shade may be taken away by degrees, air sparingly admitted by propping up the edge of the glass, and the cuttings will shortly afterwards be found to have rooted, when they are to be potted, and placed in a frame. We have described this process because a house or frame is wholly unnecessary, and artificial heat quite superfluous. June is the fittest month for the operation, the shoots being then in that half-mature condition which is most congenial.

In the year 1837, a new impulse was given to the cultivation of Fuchsias by the introduction of *F. fulgens;* and the subsequent addition of *F. corymbiflora* opens a still wider field for the exertions of the hybridist. The beautiful breeds that have resulted from cross impregnation between the former of these and the species which bear their blossoms singly in the axils of the leaves, have nearly all taken the character of the old kinds as far as regards the disposition of the inflorescence; but its size, and colour, and the appearance of the leaves, are certainly great improvements. If the doctrine of a celebrated living botanist, that there are no bi-generic mules, be correct, the facility with which the habits of *F. fulgens* have united with old-established species, completely confutes its claim to constitute a new genus; and we may mention that the anomalous forms it sometimes takes are palpably accidental.

With *F. fulgens*, a method of culture rather novel in this genus has come into vogue. Both the species and the hybrids generated by its agency can be forced so as to bloom nearly the whole winter; and *F. corymbiflora* is exactly of the same nature. Thus, the lover of forced flowers may have Fuchsias in bloom from Christmas to the beginning of the summer, as well as from that time till late in the autumn; a warm greenhouse or a temperate stove being all that is requisite in the former instance.

F. fulgens, and most probably *F. corymbiflora*, need pruning in rather a different manner to the species before mentioned. After the first year their woody stem must be cut down about six inches or a foot above the soil, and the shoots that then issue from it must be thinned, leaving only so many as it is thought will be strong enough to bear flowers; for, since the blossoms appear in terminal branches, and only on the larger shoots, it is impolitic to suffer the lesser ones to remain and exhaust those bearing flowers. In after years, the branches can be shortened, as already directed for the other kinds; but the younger ones emitted by them should still be relieved of the weakest while in a progressive state.

Those who force *F. fulgens*, *corymbiflora*, *Standishii*, or hybrids of similar origin to the last, should bear in mind that it essentially weakens the plants, and that it is not advisable to subject their only or best specimens to artificial heat.

ROCKERIES, GROTTOES, AND CAVERNS.

In a country of which the most characteristic feature is flatness, monotony, and tameness, considerable relief is often obtained by introducing objects in themselves wildly natural, or rudely picturesque. And the effect is rather heightened than otherwise by the remote contrast they afford to the surrounding scenery, and the manner in which they carry the imagination to districts where such peculiarities preponderate.

A small villa, for example, situated on a level tract of land in the vicinity of one of our large English towns, derives great interest from having a secluded nook, where the visitor can retire, as it were, into a rural or romantic dell, and seem almost shut away from the great world about him.

But it is not to undiversified or highly-cultivated spots, or those in which the art of man is prominent, that the pleasure resulting from viewing rugged inequalities and rock-like groups is restricted. In the most romantic positions, nature may generally be improved or added to; her beauties rendered more beautiful, her apparent deformities concealed; and advantage may be taken of her capabilities, to rear structures and piles in which, while the ingenuity of man shall be perceptible, the outlines and materials shall be decidedly inartificial.

It will be seen that we here refer to those assemblages, so varied in their forms, constituents, and objects, which bear the common names indicated in the title of this paper. That their legitimate province is sometimes overstepped, the limits to which they should be confined frequently exceeded, and the true principles of their composition very generally outraged, by persons fond of variety, or unacquainted with the rules of taste, are matters of too great notoriety, and of too common occurrence, to admit of a doubt. It may be well to expose some of the prevailing departures from propriety on this head; for errors in judgment, taste, or execution, cannot, unless known and perceived to be such, escape perpetuation.

We do not intend to distinguish errors of the former kind from those of taste; a refined taste, or perception of the beautiful and the appropriate, always resulting in some degree from the possession of a sound, discriminating, and well-cultivated judgment. The first deviation from tastefulness connected with the construction of rockeries and their concomitants which we shall now notice, is the placing them near a mansion, or any great work of art.

Even in those localities where the scenery becomes gradually wilder and more savage the farther it recedes from a residence, and there is a regular and perfect progression from the artificial rockery to the mountains and glens around, nothing can compensate for the absence of that high state of cultivation, and congruous arrangement of parts to correspond with the style of the house, which should ever attend an architectural erection. A dwelling, of whatever description, is plainly and palpably a specimen of art; and it is an established rule, that the space immediately around it should partake of the same character, merging only by slow degrees, and in proportion as it falls away from the central point, into the more natural features of the distant country or the neighbourhood.

To bring, therefore, on a lawn contiguous to the house, piles of rocks which represent the most truly natural features in spots on which the hand of man has never been employed, or over which, perhaps, his foot has never trod, is, by eminence, entitled to be regarded as one of the most monstrous infringements on taste. Not only is it requisite, however, that the ground encompassing a mansion should be free from all the irregularities and vagaries which mark strictly natural scenery, but the same restrictions hold good with respect to the flower-gardens, parterres, or ornamental gardens, fronting or encircling all sorts of architectural buildings. Temples, conservatories, and other garden structures that are not absolutely rustic, must not be invaded by the wildness of nature, nor their precincts be rendered too conformable to natural circumstances, or studded with anything that has the appearance of rusticity and carelessness.

Several instances might be mentioned to which the objections thus made are particularly applicable. We sometimes see little villas, of scarcely an acre in extent, in which grottoes are on the same level, and quite unconcealed by trees, within a few yards of the house; and cases have been presented to our observation in which large heaps of rockwork form the principal foreground to a residence, as viewed from the road passing in front. More glaring examples, because of greater pretensions, are to be found in a few places really celebrated for their rockeries, where the materials are actually scattered in groups on the lawn directly connected with the main façade of the mansion. To all these we must distinctly apply the most unmitigated censure.

There are conditions, nevertheless, which render the proximity of rockwork to buildings tolerable, and even interesting. When flower-gardens front a residence, a conservatory, a range of floricultural erections, or any other architectural appanage to the pleasure-grounds, and it is especially desired to cultivate those plants which either succeed best among rocks, or produce a better effect when planted on them; their introduction will be proper, and deserving of approbation. Only it should be apparent in their figure, and in the prominence rather of the plants to be grown than the substances on which they are elevated, that the imitation of nature is not attempted, but merely the provision of a suitable medium for cultivation.

In addition to the necessity for keeping masses of rustic work adequately remote from the more conspicuous productions of art, and the luxuries of a home scene, it is of little less importance, as far as relates to the enjoyment of those occupying a mansion, or inspecting a garden from its apartments, that rockeries should not be discernible from any part thereof. Undoubtedly, when on a scale of sufficient magnitude and grandeur, they may become fit components of the distant garden scene, and give to it a diversity which might else be lacking. But the means are rarely at hand for carrying such a work as this into effect; and where there are facilities, nature either more appropriately employs them, or there is wanting that genius which can alone make use of them in a becoming manner.

Piles of rocks, however rude, meeting the eye among trees, flowers, and other garden decorations, must be particularly impressive, and characteristic enough in themselves to demand specific attention, and their entire outlines be so bold and visible as to make them individually noticeable, or they cannot enhance the pleasure derivable from any view. To place them where they are half seen, half hidden amid the luxuriance of vegetation, from the windows of a dwelling, is, consequently, to be guilty of another breach of propriety and taste; and rockeries that circumscribe small gardens in which there are no trees to conceal them, or that are raised on an eminence to bring them within the range of vision, are only the more offensive the more natural they are made, and the more highly tended is the intermediate space.

Advancing yet further in our exposure of prevalent faults, we come to one which is probably not so gross as those already depicted, though it derives increased force, and is more likely to be followed, from its exceeding commonness. It is that of letting any of the objects referred to in this paper be visible from other parts of the garden, particularly from distant positions. By thoroughly isolating these things, they may be introduced to the most limited gardens; while in the largest, if not duly retired, they will never have a good effect. To feel their full influence, the spectator should come upon them unexpectedly out of a rich or agreeable portion of the pleasure-grounds; and when he has left them, pass again to some scene in which trees, shrubs, and flowers are abundant, without being able to discover more than the direction in which the spot he has quitted lies.

Seclusion is indispensable for rockeries, on two grounds. First, the beholder requires to be near to them in order to detect their several beauties; as the extent, and proportions, and shape, will be too indistinct and petty to be attractive, with a spacious foreground between. Second, they will not mix and combine harmoniously with the other features of a pleasure-garden; but have the greatest interest as detached groups, complete in themselves, and neither lending a charm to anything around, nor borrowing from aught their own peculiar attraction, beyond the preparatory influence which the one and the other exercise on the mind of the inspector.

From what has just been stated, it will, then, be obvious that a confined dell or hollow is by far the most proper situation for a rockery; and we may now add that a grotto or a cavern ought ever to constitute a part of a general rockery, and not be erected in a detached state. A rockery may exist without a grotto, and yet be as ornamental; though the erection of the latter without some rockwork to accompany it, cannot be recommended or approved.

In places where a natural dell is to be found far enough from all the structures before alluded to, the materials can be taken to it in the requisite quantity; its outline being varied according to a prepared design prior to the commencement of any erection. Should no hollow of the kind naturally occur, it will have to be excavated. The site must by all means be below rather than above the general surface. Let the stones, pieces of rock, flints, roots, &c., be piled against the banks of this hollow, securing, however, a due variety by having them in some parts sloping, in others perpendicular, and in a few shelving outwards from the base.

No subject in the gardening profession calls for a more vigorous exercise of skill and talent than the formation of rockeries and their appendages. It is here that the difference between those who have studied from nature, frequented her most savage territories, and drunk in with avidity their inspiring influence,—and such as have spent all their days in the vicinage of towns, or located themselves in a dull and level district, or failed to employ their minds in the contemplation of external objects,—is vividly manifest. Individuals of the latter class—and they are evidently numerous—when they essay the erection of anything imitative of nature, encumber their work with straight lines, or meaningless conceits; and hence rockeries too usually take the form of boundary walls, and grottoes of childish toys. Pre-eminently designed to excite attention and afford gratification, they should be pre-eminently natural; and as well in the choice of materials as their arrangement, this point should be continually before the thoughts.

If the summit of a grotto or a rockery rise above the dell in which it is placed, it will be easy to plant evergreen shrubs or trees on the outside of it, or train ivy up the parts that would be seen from without. Directions for putting the materials together would be little better than ridiculous. Irregularity and diversity must undoubtedly be aimed at, but it should not be forgotten, that nature, in different situations, assumes a certain indefinable uniformity of figure, one of which may be allowed to pervade each detached group.

We hope these strictures, which are intentionally very general, and have for many reasons not been illustrated by references to well-known objectionable examples, will be at least instrumental in directing notice to a few of the absurdities that have hitherto been perpetrated in the way of rock-gardens, and in inducing gardeners to attempt something more worthy of the present state of the art.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR JUNE.

BRACHYCÒME IBERIDIFÒLIA. One of the prettiest annuals lately introduced, and conspicuous for the variety of colours exhibited in its daisy-like flowers. Blue, lilac, pink, and white blossoms are common in every shade, and are disposed on elegant branching stems, which differ in height according to the treatment they receive. Being from the Swan River colony, it succeeds best as a half-hardy plant, and should be grown in the open border. It has been raised from imported seeds by Mrs. Wray, of Cheltenham, and is now to be obtained of most nurserymen. *Bot. Mag.* 3876.

BRÒWNÆA GRÁNDICEPS. At length this noble plant has produced its magnificent flowers in the stove of Richard Harrison, Esq., of Liverpool; though it is not stated under what circumstances the inflorescence was developed. Its stately pinnate, half-drooping, and richly-mottled leaves are well known, and the blossoms are borne in immense bunches or heads near the extremities of the branches. They are arranged in tiers; and " every day witnessed the expansion of a new tier above those of the former days, till at last the whole mass became a globe of living and glowing crimson. This brilliant head appeared on the side of the main stem, among the leaves, which at that time presented a singular phenomenon. Every evening they rose up and lifted themselves from the blossoms to expose them to the dew, so that each morning these beautiful objects were uncovered; but as day advanced the leaves gradually drooped, and bent down over the flowers to guard them from the rays of the sun." A damp stove is the most suitable for the cultivation of this species, but it should be sufficiently high to admit of its growing erectly. The soil ought to be slightly enriched. *Bot. Reg.* 30.

Catasètum Trùlla. The species of this genus are mostly uninteresting except for their curious forms, and the present plant is simply remarkable for the shape of its floral lip. This "has much the form of a trowel, and is not at all hollowed out into a bag. It is merely concave like the bowl of a spoon." Mr. James Rigby, of the Stanhope Nursery, Old Brompton, obtained it from some of the tropical parts of America, and it produced a spike of thirty flowers in September last. The main colour of the blossoms is a deep green, the labellum being brown in the centre. *Bot. Reg.* 34.

Cœlógyne flÁccida. A pleasing little epiphyte, "native of Noakote, in Nepal, where Dr. Wallich found it growing on trees. Its long, stalked, narrow leaves, and the stiff scales that surround the base of the scapes and pseudo-bulbs, mottled with pitch-brown, as if they were scorched, readily point out this species." The flowers appear in long pendulous racemes, and are very abundant. They are white, with some yellow blotches, and a few small pink streaks on the lip. "There is nothing worse for these plants than allowing their leading shoot to damp off; it is some time before they form another, and then it is generally much weaker than the former one." Messrs. Loddiges flowered the plant in the early part of the present season. *Bot. Reg.* 31.

Mormòdes pardìna, *var.* unícolor. This fine variety lacks the numerous spottings which are apparent in the flowers of the species, and has blossoms of a pure yellow colour. It is a handsome orchidaceous plant, with the habit of a *Catasetum*, and long racemes of showy sweet-scented flowers, which expand in September. Mr. Parkinson, of Mexico, sent it to the collection at Woburn Abbey, where it bloomed in 1840. *Bot. Mag.* 3879.

Pimèlea spectábilis. No more ornamental plant than this has yet been procured from the Swan River Colony. It surpasses all its allies both in the size and beauty of the flowers, which, though somewhat like those of *P. hispida*, are larger, and in far more copious heads, besides being surrounded with prominent bracts, which are often richly tinged with deep crimson. The species is readily identified by its rather glaucous foliage, which is arranged up the stem in four distinct lines or rows. In the gardens of the Horticultural Society, where there are several varieties, it is planted out in the bed of the conservatory, and thrives in great luxuriance. *Bot. Reg.* 33.

Strobilànthes scàbra. A stove subshrubby plant, with deep green oblong leaves, and clusters of showy yellow flowers at the summits of the shoots. It is a native of various districts in India, and has lately blossomed in the collection of His Grace the Duke of Northumberland. "It is remarkable for being covered over with short stiff hairs, which form little points upon the leaves and stems." Being related to *Justicia* in character, it may be treated like the species of that genus, but is rather shy in producing its flowers. "This may be overcome in two ways; either by planting it in the border of the stove and allowing it to become a large bush, or by growing it in rather small pots, keeping it very cool all the summer, and bringing it back to the stove in autumn." Cuttings root with facility. *Bot. Reg.* 32.

NEW OR INTERESTING PLANTS RECENTLY FLOWERED IN THE SUBURBAN NURSERIES.

Brugmánsia floribúnda. A handsome dwarf species of this noble genus, flowering when not more than a foot high. The leaves and branches are covered with a light ferruginous down, and the flowers, which are small, are of a deep orange colour. The large inflated calyx, almost as long as the corolla, is of the same hue, and exceedingly conspicuous. It is flowering in a stove at Messrs. Young's nursery, Epsom, but it is probably a greenhouse plant.

Clintònia pulchélla, *var.* An extremely pretty variety of this brilliant little annual has just opened its flowers with Messrs. Rollison of Tooting. It is distinguished by having white flowers, with a blotch of yellow on the lower petal. In a bed of the species it would form a beautiful contrast, and it is hoped that seeds will be ripened.

Epidéndrum alàtum. This fine pseudo-bulbous *Epidendrum* is blooming in great beauty in the stove of Messrs. Rollison, Tooting. It has roundish pseudo-bulbs, long narrow leaves, and tall, strong, branching flower-spikes. The blossoms are greenish yellow, with a lip of a similar colour striped with a purplish tint. On each side of the column there is a prominent and broad wing-like appendage, which supplies the name to the species. It continues flowering several weeks.

Fùchsia cordifòlia. Lately introduced from Mexico, and flowered by Messrs. Young of Epsom. It is a plant of very regular growth, branching from the bottom to the top of the stem and taking a somewhat pyramidal figure. The leaves are heart-shaped, and intermediate in size between *F. fulgens* and *globosa*. The blossoms are produced singly from the axils of the leaves, and are large, pendent, of a pale orange colour, with green tips to the sepals. It is a rather interesting species.

Gesnèra díscolor. Probably a South American species; received and flowered by Messrs. Young of Epsom, who are at present the sole possessors of it. It has suffruticose stems and very large leaves, which have prominent and pretty purple veins interlacing each other at the back. The edges are beautifully fringed in the young state. Panicles of deep red flowers surmount the stems, and are of different shades of colour. It is very distinct and ornamental.

IPOMŒA HÁRDINGII. A hybrid production, of which *I. scabra* is apparently one of the parents, and bearing the name of the person who originated it. Messrs. Henderson of Pine-Apple Place have it with flowers of various shades of pink; but the best is of a deep rich rose colour, with a darker centre. The leaves are unusually large, resembling fig-leaves, and the blossoms abundant. It is an evergreen plant requiring the heat of the stove.

LOÀSA PENTLÁNDICA. Very much resembling *L. lateritia* in the hue of its flowers, which are, however, larger than those of that species. It is of unknown origin, and has deeply-divided leaves, which are thickly clothed with stinging bristles. Plants in Messrs. Henderson's nursery are blooming beautifully.

ONCÍDIUM INSLEAYÀNUM. Although long confounded with *Odontoglossum grande*, to which its pseudo-bulbs certainly bear a great resemblance, this splendid plant is essentially different. Leaving the pseudo-bulbs and leaves out of consideration, for those of neither have yet been seen in England in a highly-developed cultivated state, the flowers are protruded on similar racemes; but they are individually widely distinct, both in figure and colours. In the blossoms of *O. Insleayanum*, the sepals are pale yellow, much blotched with brown, except near the extremities: but the brown does not cover all the lower part of them, and is disposed in irregular stains: the lower two sepals are further merely separated from each other at the points. The petals are similar, and somewhat wavy, while the centre of the flowers is marked with blackish streaks and spots. The lip is nearly round, narrowing at the base, very slightly undulated, of the brightest yellow, with large spots of rich reddish-brown round the outside. The two upper plates in the middle of the lip are crescent-shaped; the lower two small, and merely detached at the tips. The column has long, narrow ears, curled inwards. Messrs. Loddiges flowered it in March, on a block of wood, in a compartment of their Palm-stove.

PHYSOLÒBIUM CARINÀTUM. Commonly, but improperly called *P. gracilis*. Seeds have been introduced within the last two years from the Swan River colony, and it is now in flower in several nurseries. The genus is distinguished from *Kennedya* by the inflated nature of its seed-pods. It is a slender climber, bearing its blossoms on long, erect foot-stalks, in clusters of two and three. The flowers are of a deep brownish or purplish red hue, and very showy.

POLYSTÁCHYA REFLÉXA. Brought from Sierra Leone by Mr. Whitfield last season, and first flowered by Mr. Edmonds, gardener to His Grace the Duke of Devonshire, Chiswick. It is now again blossoming at Mr. Knight's, Chelsea. The pseudo-bulbs are comparatively short and stout, the leaves long, thin, and slender, and the flowers of a delicate pinkish white and very pretty. The lip is turned back so as to cover the column, but throws itself out in an oblique direction when the flower is fully expanded.

OPERATIONS FOR JULY.

From the excessive dryness of the weather since the middle of May, many plants that were wished to blossom in the late summer and autumn months will now be thrown into a premature state of flowering, and the culturist should therefore occasionally employ himself in examining them, and picking off the flower-buds as they appear. By the adoption of this practice, the plants will be induced to spread, and form an abundance of young shoots, from which a rich development of inflorescence may afterwards be expected; whereas, without some such tendance, the flowers will necessarily be few, feeble, and in very imperfect succession.

All flowering plants that are not of transient duration, or from which seeds are not desired, should have their blossoms removed directly they fade, that no seed-vessels may be formed. The preservation of neatness alone would enjoin the performance of that duty, as nothing looks more slovenly in a flower-garden or greenhouse than long and unsightly stalks, surmounted only with decayed flowers, or uninteresting capsules. In small gardens, where particular tidiness is required, it may even be desirable to walk round the borders every evening and cut off those roses and other flowers which are on the point of shedding their petals, to prevent these from being strewn over the earth and walks. But the health of the plants is of still more importance, and it is inconceivable to what an extent that is insured by taking away those parts which would merely exhaust them without adding to their beauty, and indeed, by actually disfiguring them.

Another object will likewise be gained by this process. Wall-flowers, sweet-williams, snapdragons, stocks, and numerous plants, both annual and biennial, will often flower twice in the season, in consequence of their seed-vessels being timely abstracted. Verbenas, too, and all those charming half-hardy flowers that blossom continuously for several months, may be kept in bloom much longer, and have their flowers rendered far superior, by a similar proceeding. In short, for all the purposes of the cultivator (except seed-saving) the removal of fading flowers is of the greatest moment.

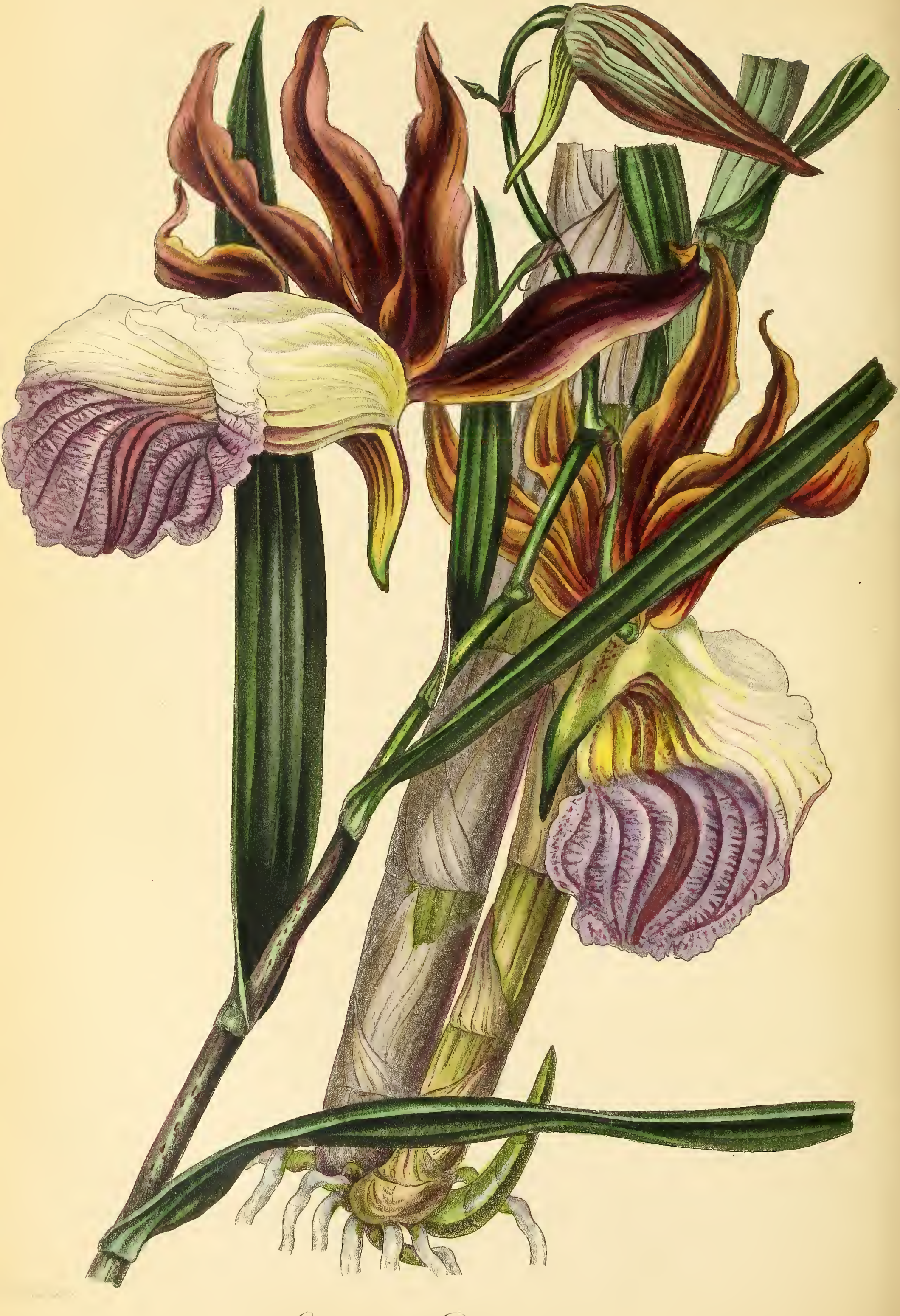
Climbing plants, which are sought to be trained in any direction, must have their shoots regulated and fastened at least once a week. If left to become entangled, or to grow long in an opposite or different course from that prescribed, they can never be relieved or recovered so as to look graceful, and are often much injured by restoration to their proper position. It matters not whether they be in the house, or on an open wall or trellis; the same principles of management apply in all cases.

It is observable, also, of every plant that needs supporting by stakes or otherwise, that unless these aids are supplied in an early stage of its progress, it will always assume a constrained and unnatural appearance, and the leaves cannot be disposed with that taste which has such a powerful effect on the eye of the spectator. Hence, if employed at a fitting period, the greatest possible amount of support will scarcely seem disagreeable; while any attempts to reduce plants to order after they have taken a shape contrary to the one proposed, will inevitably betray their nature and faults. It is a simple direction, but one which all evidently do not at present follow, and which will certainly be of use to some amateurs, that the matting employed for tying plants to trellises or stakes should always be pretty tightly twisted at the time of application, which equally assists in concealing it and adds to its strength.

In greenhouses, stoves, and other erections containing plants, (save, perhaps, the pits where those Orchidaceæ now in a growing state are kept,) we would at once bring into action all the means of ventilation that are possessed, in order, with the summer heat common at this season, to ripen the young wood that has just been formed. Greenhouses, indeed, that have front or side moveable lights, can well dispense with these at the present time. Drought is the great thing to be avoided during this month, and all moisture-loving plants, such as mimuluses, begonias, gloxinias, balsams, and hundreds of other tribes whose habits are generally known, may be appropriately furnished with pans of water beneath the pots, by which their necessities can be more constantly supplied. The objection that attaches to such vessels for common use, is nullified by the extreme evaporation that now takes place.

Syringing should never be disregarded in any plant-houses at this season. The natural aridity of the air operates so strongly on the leaves of vegetation, that the mere sprinkling of their surface of an evening refreshes them exceedingly. Added to which, dust, which is now generally troublesome, accumulates on the foliage, and does incalculable harm. And beyond even these considerations, there is the notorious fact that the red spider—that pest of plant-stoves—abounds most in a dry atmosphere, and is most readily repelled by moisture. The use of a garden-engine will frequently, moreover, be of service to climbers on walls, for the reasons above given; but it must not be violently exercised where the plants are blossoming.

The roots and branches of Pelargoniums are now to be trimmed and pruned, when they may be repotted into small pots, and placed in a frame or pit where a warm, moist atmosphere is maintained. Calceolarias, too, may be separated and potted as soon as their blossoms die. A few of the smaller plants of each should have their flower-stalks cut off, and be plunged in the pots into a border shaded by a wall, so that only the early morning or late evening sun shines on them. In this situation they will bloom again in a few weeks, and if the first buds are taken away, they will produce a tolerable effect about the month of September, when they must be transferred to the greenhouse.



Galeandra Devoniana.

GALEÁNDRA DEVONIÀNA.

(DUKE OF DEVONSHIRE'S GALEANDRA.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

Generic Character.—*Perianth* spreading, petals and sepals nearly equal, ascending. *Labellum* funnel-shaped, undivided, or obsoletely three-lobed, spurred, having four elevated lamellæ in the inside. *Column* erect, membranaceously winged, the clinandrium bending downwards. *Pollen-masses* two.

Specific Character.—*Plant* epiphytal, caulescent. *Stems* erect, simple, terete, many-leaved. *Leaves* lanceolate, three-nerved. *Racemes* sessile, erect, many-flowered. *Labellum* ovate, obtuse, crenulated. *Anthers* crested, fleshy, roundish, pubescent.

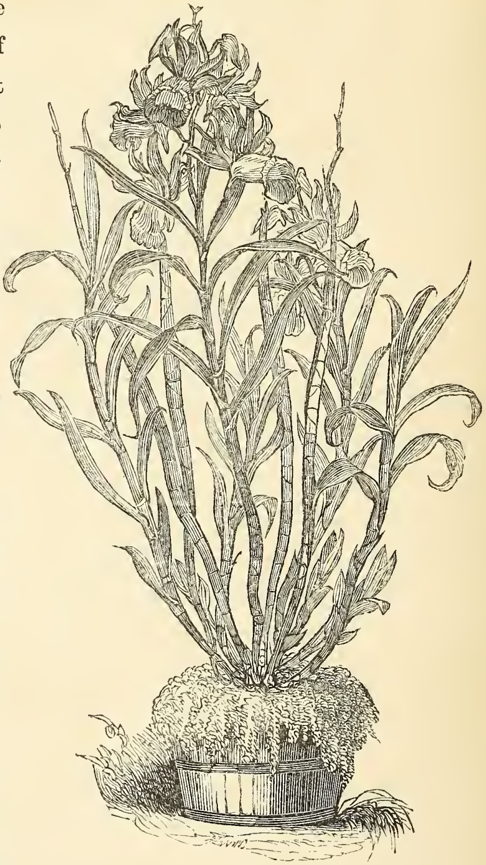
Till very recently, the genus *Galeandra* was known to cultivators solely through the interesting, but by no means handsome, *G. gracilis*, which once, also, bore the name of *Eulophia gracilis.* The beautiful *G. Baueri,* which flowered last year in several collections, opened up quite a new feature in the group; and the noble plant now figured, developed about the same time in Messrs. Loddiges' establishment, adds a yet finer species.

G. devoniana has a habit somewhat intermediate between the caulescent *Epidendra* and *Cyrtopodium.* It produces large round stems, terminated by elegant half-drooping foliage, from amongst which the lovely flowers are protruded in upright racemes. They are especially remarkable for the size and elegant markings of their labellum.

M. Schomburgk, who has introduced several splendid epiphytes from British Guiana, was the discoverer of this very ornamental plant; and from a communication of this gentleman's inserted in the admirable "Sertum Orchidaceum" of Dr. Lindley, we extract the following particulars concerning our present subject.

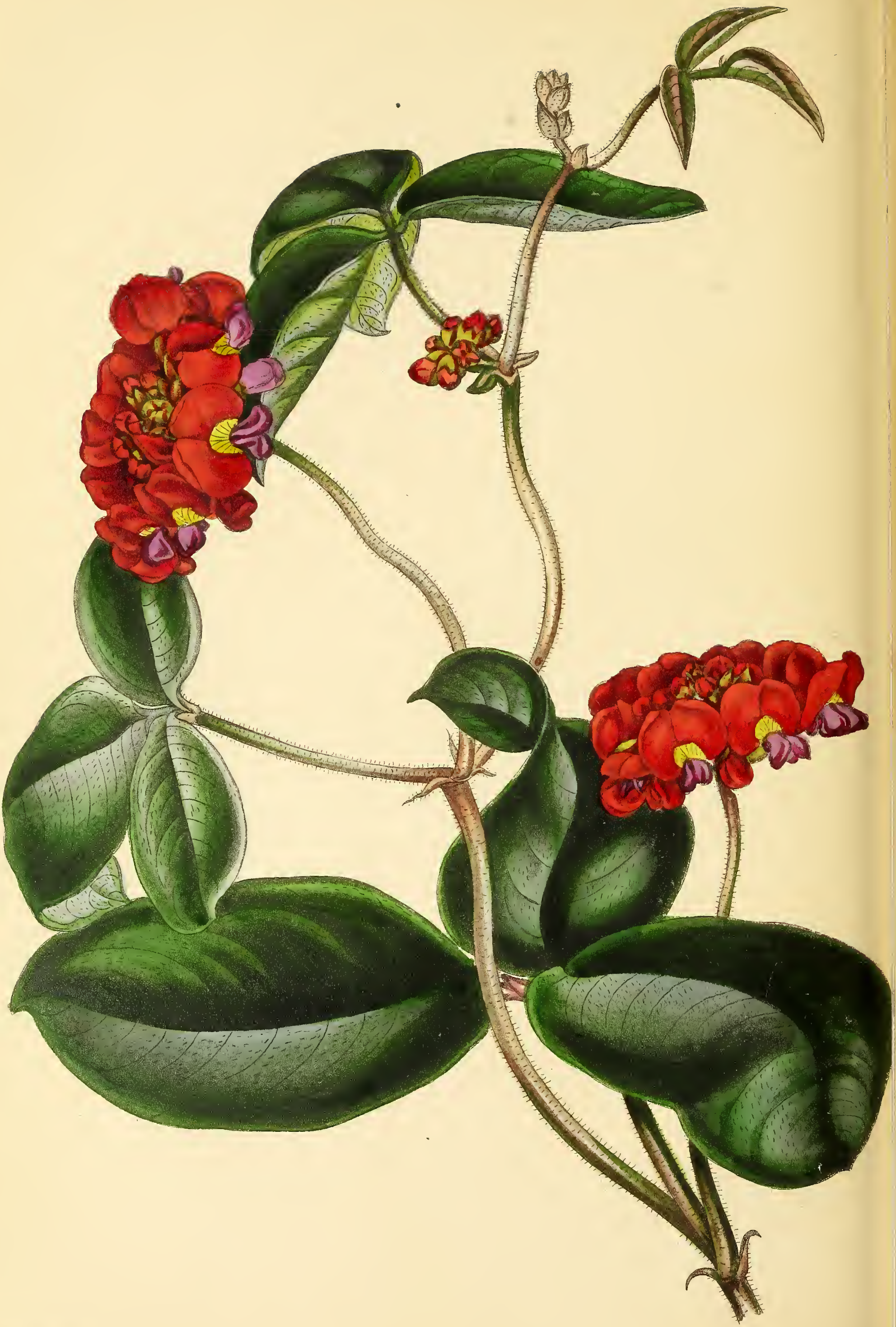
"During our peregrinations we have seen this plant nowhere else but at the banks of the Rio Negro, a tributary of the Amazon; where, in the neighbourhood of Barcellos, or Marina, we found it growing in large clusters on the trees which lined the river, sometimes on the *Mauritia aculeata*, or even on the ground, where the soil consisted of vegetable mould. It was so luxuriant in growth, that some of the large clusters of stems which sprouted from a common root were from ten to twelve feet in circumference. The stems were often from five to six feet high; at the lower part almost of a purple appearance, and changing into green higher up."

Messrs. Loddiges, with whom it first flowered, about the month of May 1840, have since had it in bloom several times, and it appears to be a most profuse-blooming species. These gentlemen treat it as the larger kinds of *Dendrobium*, potting it in heath-soil mixed with potsherds, and keeping it constantly in a warm humid atmosphere. Specimens are likewise suspended from the roof of the house on blocks of wood; but it is too spreading a plant, or grows to too great a height, to admit of being generally cultivated in this manner. Like the rest of the Orchidaceæ, it is increased by offsets. The annexed wood-cut represents its habit.



The name *Galeandra* was applied by Dr. Lindley, probably in allusion to the helmet-shaped labellum of the flowers.

Regarding the specific appellation, M. Schomburgk writes, in the work already quoted,—"As its flower is not only larger than the generality of its tribe, but handsome, I availed myself the readier of this opportunity to request the permission of His Grace the Duke of Devonshire that I might call it in honour of him, who not only is known as one of the most successful cultivators of this, one of the most interesting tribes among Monocotyledonous plants, but of whose urbanity and condescension I have personally experienced numerous proofs since my return to Europe."



Zichya pannosa.

ZÌCHYA PANNÒSA.

(WRINKLED-LEAVED ZICHYA.)

CLASS.
DIADELPHIA.

ORDER.
DECANDRIA.

NATURAL ORDER.
LEGUMINŌSÆ.

Generic Character.—*Calyx* campanulate, two-lipped; upper lip two-toothed, lower one three-parted. *Vexillum* of the corolla furnished with a claw, broadly roundish, emarginate, reflexed, with two appendages at the base, or at a distance from it. *Wings* oblong, adhering to the middle of the keel. *Keel* incurved, obtuse, either shorter or of nearly equal length. *Stamens* distinct, diadelphous. *Filaments* inarticulate with the base of the standard. *Anthers* uniform. *Sheath of the disc* none. *Ovary* with many ovules. *Style* short, ascending, subcapitate at the top, towards the stigma, often terminating in a dilated or shortly appendiculate manner. *Legume* oblong-linear, compressed, coriaceous. *Seeds* strophiolate.

Specific Character.—*Plant* an evergreeen shrub. *Stems* strong, climbing, and, as well as the leaves, covered with villous hairs. *Leaves* with long peduncles, composed of three leaflets; leaflets oblong, inclining to orbicular, mucronulate, green, and covered with close-pressed, inconspicuous down on the upper surface; whitish with pubescence, and having numerous prominent veins, below; while the mid-rib and the lateral veins are clothed with brown hairs. *Stipules* awl-shaped. *Calyx* covered with dark-brown pubescence in the young state. *Flowers* very dense. *Standard* scarlet, with a yellow blotch near the base in the centre. *Wings* and *keel* purple.

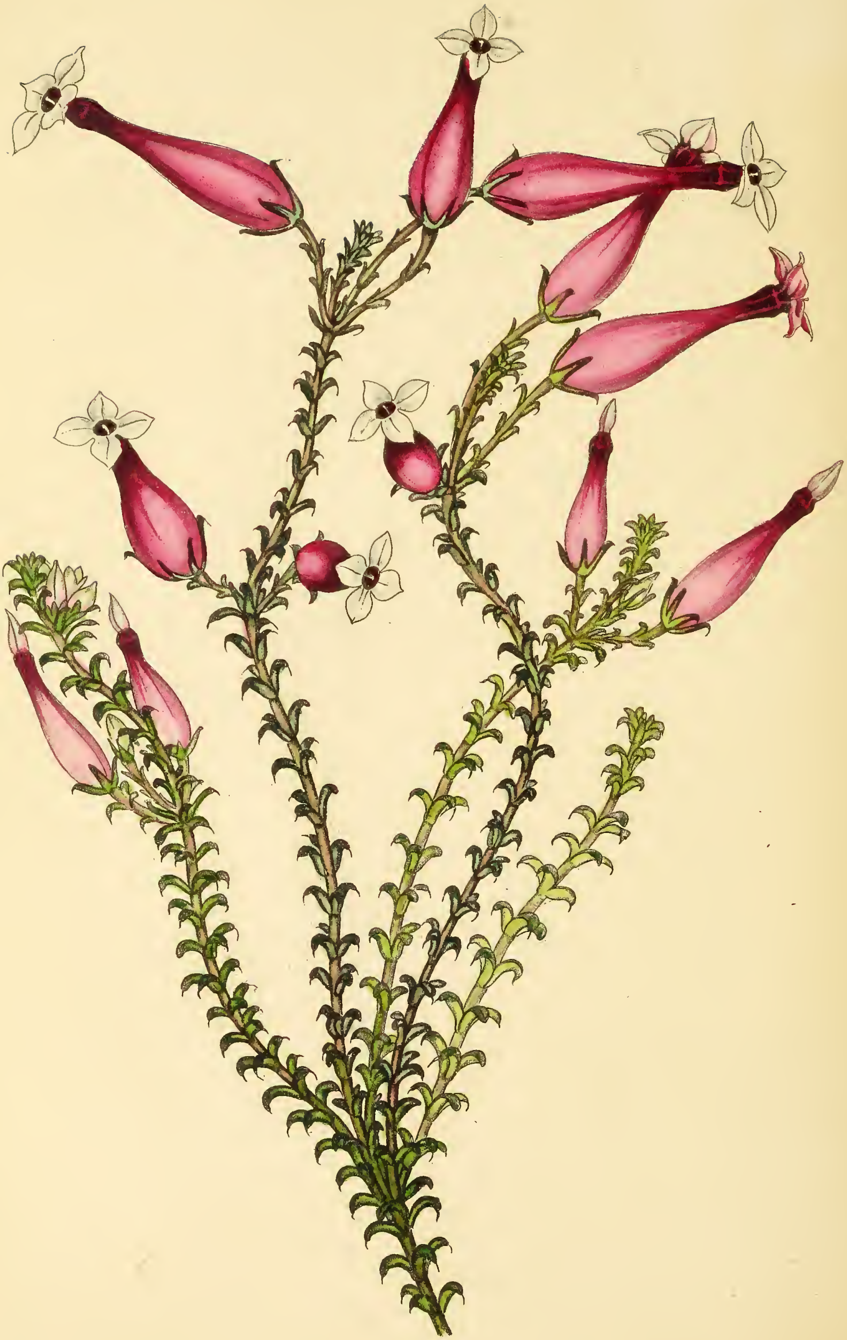
Zichya, so named by Baron Hugel, in compliment to the Countess Molly Zichy-Ferraris, now Princess Metternich, is a separation from the old genus *Kennedya*, of which *Z. coccinea* (formerly *K. coccinea*) may be regarded as the type. Its chief apparent characters are that the flowers are borne on long erect axillary peduncles, are usually in dense umbels, and have their standard of a bright red or scarlet colour.

Z. pannosa, the species at present figured, is somewhat allied to *Z. tricolor*, from which it is readily distinguished by having stronger stems, which are clothed with brown hairs towards their summits,—shorter, rounder, thicker, and more prominently nerved leaves, the stalks of which are also covered with brown pubescence,—a prominent dark-velvety down on the calyxes, and denser heads of flowers.

It is a very handsome climbing plant, lately introduced by various parties from the Swan River settlement, Australia, and now cultivated in most nurseries. We procured our drawing, however, from Messrs. Young, of Epsom, in May 1840. Such is the stoutness of its stems, that they are almost able to support themselves in the earlier stages of their growth; and the leaves, unlike those of its allies, do not feel soft and smooth to the touch, owing to the paucity of down on their surface, and the existence of such strong ribs and veins on the under side.

The treatment requisite for this plant is not in any respect different from that demanded by *Z. coccinea.* It prefers a loamy soil, with which a little heath-mould and sand can be mingled; and it should be repotted yearly, or oftener, if necessary, about the end of March, or the beginning of April. It flowers most abundantly in May and June. Specimens trained spirally round a barrel-shaped trellis will have a much better appearance and flower more profusely than those which are supported erectly, or attached to the rafters of a greenhouse; since it is the peculiarity of this and related species to have few and distant leaves, and the clusters of flowers protruded on long stalks, which two properties give it a rather naked aspect unless some means are adopted for bringing the stems closer together. The only way of effecting this is the one just suggested. We have seen an enormous plant of this species at Mr. Low's, Clapton, which was in so large a pot, that the top of the earth was strewn with pieces of broken brick, in order to attract the roots upward, and bring them nearer to the action of the air.

Cuttings root with the greatest ease, if they are not taken from flowering shoots.



Erica Jacksonii.

ERÌCA JACKSÒNII.

(MR. JACKSON'S HEATH.)

CLASS.
OCTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ERICÀCEÆ.

Generic Character.—*Calyx* four-sepalled, inferior. *Corolla* with four divisions. *Stamens* inserted in the receptacle. *Anthers* bifid. *Capsules* four-celled.

Specific Character.—*Plant* an hybrid. *Leaves* in whorls, or in opposite pairs, each composed of one larger and one smaller one, the latter above the former, short, rigid, channelled, reflexed, and mucronulate. *Flowers* generally four in a cluster, much inflated at the base, of a deep pink colour, with a very dark ring round the apex; petals reflexed.

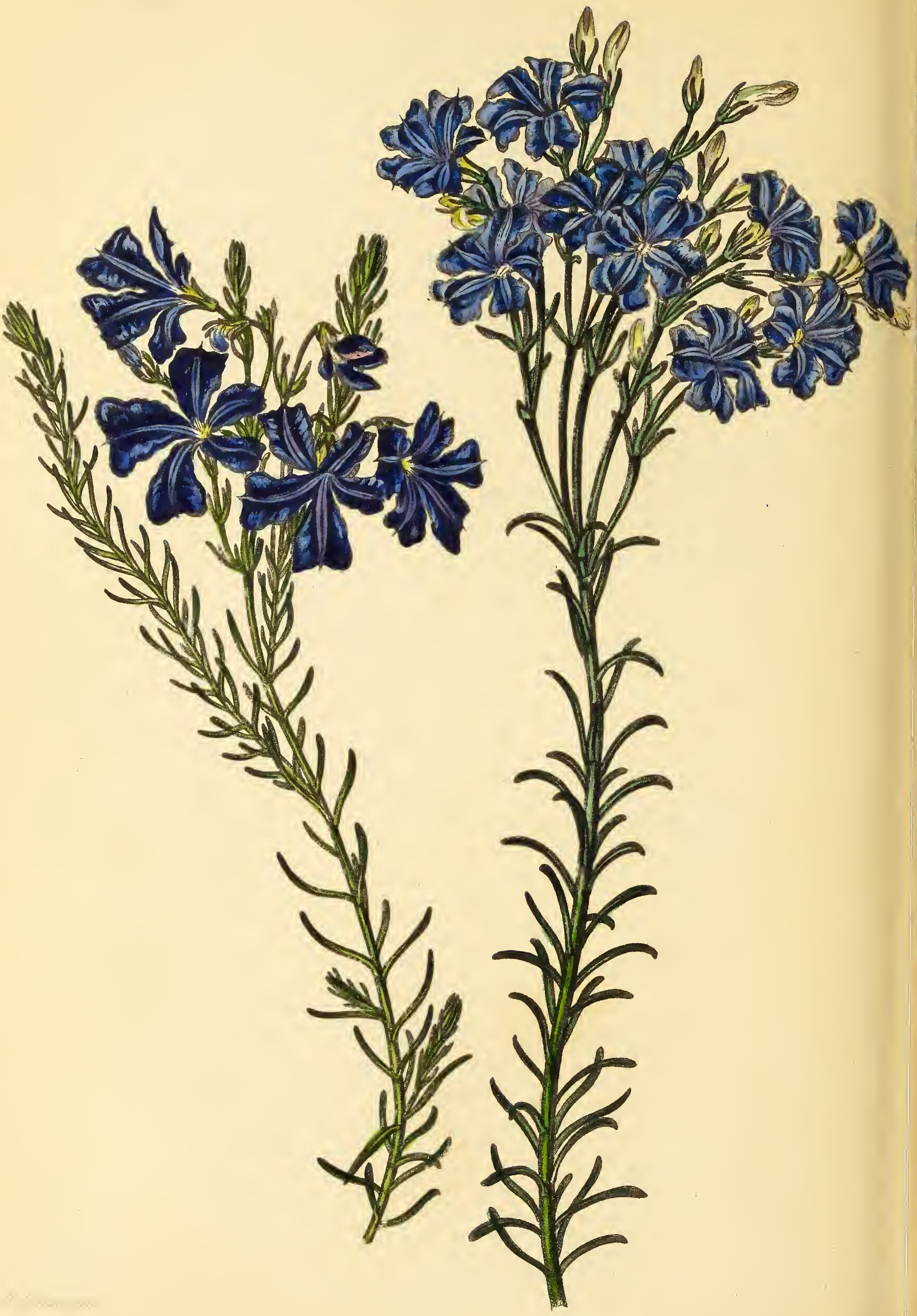
The practice of hybridising Heaths, though generally productive of advantage when judiciously applied, should never be attempted except for the purpose of combining the elegant, bushy, or otherwise ornamental habit of one species, with the beautiful or splendid flowers of another. Its legitimate object is to improve the character of certain admired kinds, by associating the features in which they are superior with those in which they are deficient, but which may be possessed by other sorts; and not to seek the intermixture of species far removed from each other merely for the sake of variety.

An instance of the successful intermixture of the better characteristics in two showy species is afforded by the beautiful and graceful hybrid here represented. It was raised by Mr. Jackson, nurseryman, of Kingston, Surrey, between *E. Irbyana* and *E. retorta*, and the more elegant mode of growth common to the latter is united to the splendid blossoms of the former. It is a hard-wooded plant, apparently more robust and less difficult to cultivate than *E. Irbyana;* while the flowers, which are very well depicted in our plate, are pleasingly disposed, and covered with that shining glutinous varnish which so much enhances the beauty of many Heaths.

That the genus is by no means of such arduous cultivation as is usually imagined, has often been asserted in this Magazine. In the neighbourhood of the metropolis, the great point is to preserve them from mildew during the late summer months; and this is too frequently done by exposing them in the open air. Where they can be properly shaded from the fiercer rays of the sun, such exposure will be at least relieved of some objections that would attach to it. But by placing them on the stage of a greenhouse, or in a frame, in such a manner that an abundance of air can be made to circulate around and below them, mildew will be avoided, and the plants will not be subjected to the violent changes of weather which occur in our climate.

Whether in houses or in the open air, however, they must not be so situated that the sun can strike freely and directly on their pots; for no care in watering would suffice to save the roots from injury under such circumstances. To protect them thoroughly in summer, they ought to be below the level of the wall of the pit, frame, or house in which they are kept; and, especially, they should be rendered so compact in their growth by the repeated removal of the points of the young shoots, that the lower branches may themselves assist in shading the pots.

Our figure was made in Mr. Jackson's nursery, about the middle of July 1840. It commences flowering in that month, and continues till October.



Lechenaultia biloba.

LECHENAÙLTIA BILÒBA.

(TWO-LOBED LECHENAULTIA.)

CLASS.
PENTANDRIA

ORDER.
MONOGYNIA.

NATURAL ORDER.
GOODENIÀCEÆ.

Generic Character.—*Calyx* superior. *Tube* of the corolla cleft on one side ; limb bilabiate. *Anthers* cohering at the time the flowers are expanded. *Grains of Pollen* compound. *Stigma* obsolete, in the bottom of the bilabiate indusium. *Capsule* prismatic, two-celled, four-valved, opposite valves septiferous in the middle. *Seeds* cubic or cylindrical, nucumentaceous.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub, growing about a foot in height. *Stems* erect, smooth, slightly branching. *Leaves* in imperfect whorls, or irregularly disposed, cylindrical, acute, sometimes a little reflexed. *Flowers* produced at the extremities of the branches, of different shades of blue. *Corolla* five-parted, lower two segments smaller, all the lobes somewhat ovately-spatulate, broader towards the end, more or less deeply divided, and having a small point at the summit, rather reflexed.

A blue-flowered *Lechenaultia* has been a subject of speculation and interest among nurserymen and gardeners for several years past, and it has been often asserted, and as often doubted, that plants of such a desirable novelty were in the possession of cultivators. This season has, however, put a period to all further disputations on the matter, by developing the charming blossoms of the species now first delineated.

Whatever questions may have been raised regarding the relation of the present species to *Lechenaultia* before its flowers had been seen, had some colouring of propriety in the decided superficial resemblance of the plant to *Burtonia conferta*, which, it is known, produces deep blue or purple inflorescence, and it was thought that, without the least intention or desire to be misled or to mislead others, the two might have readily been confounded. That there is a distinction, nevertheless, even in the aspect of the plants, has always been clear to those who have examined them. The leaves of *Burtonia* are quite glaucous, and the stems become a dark yellow as they harden ; neither of which characters is apparent in *Lechenaultia*. The foliage of the latter is, besides, longer, more spreading, and reflexed.

But the beautiful flowers of *L. biloba* present the principal objects for notice. They vary in colour, from a light cerulean blue, to a deep lapis-lazuli tint. The form of the petals is likewise liable to change, the indentations at their extremities sometimes being three times as deep as ordinarily. It was originally flowered in the collection of Mr. Veitch, nurseryman, of Exeter, and the small size of the plants on which the earliest blossoms were expanded shows that the species is far from being a scanty-flowerer. From larger plants which this gentleman sent to one of the Horticultural Society's meetings in Regent Street, in April last, we were kindly allowed to have our drawing prepared. It exhibits two kinds, which appear to us to be mere varieties of the same species, but which may, possibly, be specifically distinct; the one having lighter green, shorter, and more upright leaves and very deep blue flowers, and the other bearing blossoms of a paler tint, with a rather more regular corolla. They agree in the extent to which their petals are divided at the points, and this is the leading feature of the species.

This is one of those delicate plants which, like the *Burtonia* already referred to, require some attention in their culture. They are most commonly injured by stagnant or superfluous water about their roots, which is caused either through an insufficiency of drainage, a soil too destitute of fibre, or being planted in too large a pot. Heath-soil should be the principal constituent in the compost employed for them, but it must not be deprived of the fibrous roots, or other coarse matters it contains, and should merely be broken up by the spade or hand without being sifted. The plants ought, moreover, to be kept in small pots, freely exposed to light, and watered with the greatest caution. In permitting light to act unreservedly on the leaves, however, it is advisable not to leave the pots too much exposed in summer. The species, though it does not flower so profusely as *L. formosa*, seems to bloom through most of the summer months.

The generic name comprises that of M. Lechenault, a French traveller and botanist, to whom the genus is dedicated. The specific designation, *biloba*, refers to the division of the petals.

OF GARDENING AS A SCIENCE.

NO. VII.

Having at page 131 adduced the authority of Liebig, to show that the humus of the soil is not taken up by the roots of plants as nutriment, and suggested to the gardener some of the means and experiments by which he may bring the accuracy of the theory to the test, we propose to dismiss the subject, and, at the same time, to lay aside, and altogether repudiate the term *humus* as applied to the garden, leaving the agriculturist to retain it or not at his pleasure. It matters little what is said or thought of a subject which the mind cannot understand; and as the horticulturist avails himself of substances little used on the farm, we will confine our remarks to them exclusively.

What, then, *is manure*, and how does it operate on the produce of the garden? The questions are knotty and complicated, and they apply in a two-fold direction. Every one versed in general horticulture must be perfectly aware that the same soil, the same enrichment, (or "dress," of whatever kind it be,) will operate very differently upon plants in the open ground, and when confined in pots. Take, for instance, that staple of the garden, virgin loam; and at this point we cannot do our subject more justice, or afford the reader more satisfactory instruction, than by referring to the evidence of the esteemed veteran, Mr. James Main.

"Newly-reclaimed lands, whether from old pasture, fallen woods, or commons, or fresh loam dug from pits, are all, for a few years, exceedingly productive without assistance from manure, or other treatment, save digging or ploughing. This virtue of maiden soil, whatever it may be, is at last dissipated by repeated cropping; and then the land must be refreshed with a dressing of some kind of manure. I have never read or heard of any trial having been made by chemists to analyze maiden earth, with a view of ascertaining what that particular quality is which proves so exciting and beneficial to vegetation. Its effects are well known to all cultivators. Trenching and trench-ploughing are the ordinary means for gaining upon the surface an additional stratum of virgin earth; and the good effects which follow sooner or later are sometimes attributed to the true cause, namely, the addition of new, untried earth, though by others it is said to be owing to the increased depth of the staple." Mr. Main argues very justly that the new stratum must be the exciting agent, and adduces agricultural data to elucidate his argument:—he then urges the question, "*What is* that property of maiden earth, which when aërated proves so exciting and nutritive to the roots of plants? It cannot be humus, that is, decayed vegetable matter, unless very ancient indeed, and deposited contemporaneously with the chalk formations; for I have found it reposing on chalk in considerable masses which seemed to have felt no disturbance since the Deluge, and in situations where no enriching fluids could be received and yet, for the sustentation of plants, whether native or exotic, it is invaluable, as may be proved by many instances. It would be well if, by chemical analysis, any light could be thrown on the matter. Perhaps it *may be some simple body*, which may be artificially collected and applied with less trouble, and equal effect, as more ponderous materials." (*See British Farmer's Mag.*, *April*, 1841, p. 93.)

If any of our readers can retrace the astonishing effects of a loam, raised by the spade in trenching from a depth of nearly two feet, and which had evidently reposed upon a substratum of chalky and flinty marl, or other coarse stuff, undisturbed for centuries, upon a crop of any of the cabbage tribe, he will be satisfied with the truth of Mr. Main's remarks.

On such a loam, yellow or brown orange in colour, void of any traceable fibre, and to a demonstration free from a particle of any substance that could bear the name of manure, a plot of potatoes, cabbages, broccoli, and the like, the latter planted in July within three days, or in detail, row by row, as the trenching has advanced, have thriven with a rapidity, verdure, and luxuriance that nothing could excel. What then, we inquire, chemically, has been and is the exciting agent? Such a loam is composed chiefly of insoluble sand, of perhaps one fourth of alumine, or the matter of pure clay, of oxide of iron (the colouring material) and generally of a small per-centage of chalk (carbonate of lime). Now any, or all of these, however varying in their proportions, are little soluble in water; but the loam so constituted, if Liebig's authority be taken in proof, invariably contains a proportion of vegetable alkali, *potassa*, of which substance, wherever it be found in the vegetable organization, it is the sole source and parent. Here, then, Mr. Main's most valuable suggestion is realized; for a body, though not absolutely simple, a chemical agent, *is* discovered, which being extremely soluble, is most energetic and potential in its effects upon the vegetable fluids. It also exists in its most available form and proportion in virgin loams, and therefore we are justified in concluding that to *potassa* may be ascribed those luxuriant results which are the subject of inquiry.

But such loam, however invaluable to vegetable culture, producing that flavour and purity which can never be obtained from manure in any form, will not avail in pot-culture; it is altogether too binding and intractable. The principle, nevertheless, remains in full force, and therefore the judicious gardener has recourse to the turf taken off the purest loam of a common or grass pasture; this he lays up in mass, turns, incorporates, and finally uses with its fibrous remains. Hence he obtains the best soil in a form and temperament that will give freedom to the progress of the roots, and yet has not lost one particle of those salts which play so important a part in the economy of vegetation.

But does his soil become paler during a course of culture? does it in any way present signs of impoverishment? Certainly not; it acquires depth of tint, it gains humus, and, after a time, the colour is darkened by several shades, proving that *carbon* has been deposited—not abstracted. Yet new soil is soon required;

and, again, a prudent addition of fresh turf, and frequently assisted by the whitest sand, will renew the energy of vegetation, and, simultaneously, all the corresponding phenomena. We have now, while conscious of much ignorance of those wondrous causes which are ever varying their "ceaseless change," presented the reader with matter for deep reflection—and, we hope, for profitable inquiry and experiment.

TREATMENT OF A FEW ORNAMENTAL PLANTS.

THAT there are many plants of the most ordinary beauty which, under appropriate treatment, assume an exceedingly attractive and showy character, and that even the most ornamental are susceptive of wonderful improvement by congenial culture, are matters almost too trite to need recording. But as in the wilds of Nature thousands of lovely blossoms are "born to blush unseen" by man, so, in the refined gardens of the floriculturist, systems of managing plants are frequently pursued unnoticed for years, which, when made known, are found deserving of general adoption.

We cannot positively affirm that the facts contained in the following observations have been long kept in obscurity, or that some of them may not be familiar to a large portion of our readers; yet we consider that in thus giving them publicity, and, if not primarily communicating them, at least confirming their utility, we shall be adding our mite to that treasury of information which shall one day raise the practice of horticulture infinitely above the exalted standing it has already attained.

Clematis cœrulea claims our earliest attention, on account of its peculiarly handsome flowers. There are two varieties of this beautiful species, one bearing somewhat larger blossoms of a deep purplish tint, and the other having flowers of a light blue colour. They are, however, of equal value, and exactly similar in habitude and foliage. Although the species is thoroughly hardy, it does not produce that profusion of flowers which renders some of its allies so remarkable; the individual blooms being of so large a size as to be more than usually scattered. For this reason, if trained to a wall or wall-like trellis, the remoteness of its leaves and flowers is such as to impart a straggling appearance which injures its effect.

As a means of bringing the leaves and flowers into closer contiguity, and arranging them over a smaller surface, the plant has been trained by many round a low and broad cylindrical trellis; but while such a plan partly answers the purpose for which it is intended, we cannot think it so effectual as a system followed by Messrs. Rollisson, of Tooting, with the results of which we have been much gratified during the last two seasons.

The method referred to is as simple as it is suitable, and fulfils the double design of best exhibiting the flowers, and facilitating extensive propagation. A specimen is planted in the spring in an open bed or border, and the branches are immediately pegged down to the earth, and that part of them buried which is intermediately between the joints. By making them to cross each other in various directions, the parts bearing the buds, or those portions which are above the soil, may be kept regularly at about two inches apart throughout the whole of the piece covered; and from these buds there will, in the ensuing season, rise a number of short branches, terminated by their splendid flowers. The whole will thus have the aspect of a charming dwarf shrub, and the foliage and blooms will be equally dense and abundant.

When these lateral branches have ceased blooming, they may be fastened down in the same manner as those from which they sprang; by which means, in every future season, after allowing for the abstraction of many young plants that will have been formed by the layering, there will be a constant addition of new shoots, and the bush will be continually extending itself, as well as growing more compactly.

Where there is a choice of situations, the one selected for *C. cærulea* should be a little sheltered from the north and east, and open to the opposite quarters. Much importance is not, however, attached to this point, and if the soil be a rich friable loam, not too much exposed to either aridity or saturation, the plant will flourish in the greatest luxuriance; as, from the quantity of roots it must form, the severest cold will scarcely affect it. In plots for which a succession of flowers is not so much desired, specimens treated as above recommended would form a very beautiful bed, and would flower for at least two months in the year.

The object of the mode here briefly described being to bring the leaves and inflorescence closer together, and to place the latter so below the eye that it can be looked down upon, (seeing that no part of the flower is so interesting as the upper surface,) there can be no doubt, since these are the great desiderata with *C. Sieboldii*, that the like treatment would enhance its beauty to the same extent. Still, as the latter species blooms far more liberally than *C. cærulea*, it is better adapted than that plant for growing on trellises; and, notwithstanding its hardiness, a few specimens should always be kept in pots for the greenhouse. Trained to a wall, or any analogous erection, or to the rafters of a house, its flowers, always having the centre turned upwards, are uninteresting when they are situated where, in order to see them, it is necessary to look up; and from the disposition of the plants to bloom chiefly towards the extremities of their shoots, this disadvantage is hardly to be avoided.

But the proper way of managing *C. Sieboldii* is to fasten it to a trellis, which, if affixed to a pot for standing on a stage, ought not to be more than three feet high, and, when placed in the open ground, or in a conservatory border, or anywhere on a level with the path on which the observer walks, about twice that altitude. Whether the trellis be barrel-shaped or angular is of little consequence, provided the shoots are arranged closely around it. If duly exposed to light, the flowers will nearly all be protruded to the outside of the trellis, and their beauty will then be easily discerned.

Deutzia scabra is an exceedingly interesting shrub, lately added to our collections, as hardy as the common Syringa, and apparently requiring as little tendance. We saw last month, however, in the nursery of Messrs. Young of Epsom, a specimen of this species which so far surpassed what we had before witnessed, that we are induced to relate the very easy method by which its perfection had been realized.

Like most kinds of *Philadelphus*, it has a tendency to emit many suckers annually from its roots; and unless some of these are cut off or extracted soon after they appear, the plant will acquire a character rather of luxuriance than of productiveness. If, on the other hand, only four or five suckers are left every year, these, in the ensuing season, will bloom with a prodigality which is quite astonishing. The specimen above mentioned was about three or four feet in height, and the branches, judiciously brought together, formed a slender pyramid, covered with thousands of snowy white blossoms, pleasingly relieved by the bright green leaves of the few new shoots that had been left to flower in the succeeding year. We may truly observe that it was an object which not more delighted than surprised us.

We must now pass from hardy shrubs to an orchidaceous plant, in the management of which cultivators have been too unmindful of its habits, and have, consequently, not enjoyed the whole of its charms. The plant to which we allude is one of the loveliest species of the surpassingly rich genus *Dendrobium*—*D. fimbriatum*. An enormous specimen of it was flowered with extraordinary success by Messrs. Rollisson of Tooting, in June; and we are desirous of reporting one or two features in the culture it had received.

It is not a little perplexing to some cultivators who are the strenuous advocates of a season of repose or drought for Dendrobiums, that Messrs. Loddiges, whose specimens of this genus are notorious alike for their magnitude and for the splendid manner in which they flower, never vary their treatment, summer or winter, beyond the necessary modification caused by the seasons themselves. The effects obtained by these gentlemen are, however, greatly due to the old and established character of their plants, and the singular power which Orchidaceæ possess of conforming to almost any moderately suitable, *regular* system of cultivation. And it may be remarked that Messrs. Loddiges' Dendrobiums flower, for the most part, on the old defoliated stems alone.

Now Messrs. Rollisson's specimen of *D. fimbriatum* had been kept in a state of drought and torpidity through two or three of the winter months, and this suspension of its powers was so prolonged into the spring, that its flowering period was deferred till June, which is two months later than ordinary. The flowers, in consequence, when they were produced, appeared all over the young as well as the older shoots, and their intense golden hue was rendered far more brilliant by having such a lively green background in the foliage.

To facilitate the drying winter process, the plant is kept in a large open wooden basket, composed of hazel or oak billets, filled with sphagnum and heath-soil, and suspended from the roof of the orchidaceous-house. Thus, while it can be at once dried by withholding direct supplies of water from the roots, the leaves will imbibe the moisture always floating most freely in the higher stratum of the atmosphere, and preserve the plant from withering.

What we most wish to impress on cultivators, however, is the impropriety of supporting the stems of this plant. When suffered to assume their natural position, and become half pendent, as in the case of Messrs. Rollisson's specimen, they are relieved from that artificial and constrained condition in which they are usually seen, and gain all the enchantment for which they are so remarkable in their native habitats. The flowers, too, are better displayed. Probably many other species would be as greatly benefited by being released from the erect position to which they are reduced by the hand of art, and permitted to take a more drooping direction. They would certainly be more graceful.

Of *Lilium speciosum* and its varieties, we have recently declared our belief, from several instances of which we are cognizant, that they grow too grossly and luxuriantly if planted in the border of a partially shaded house. As we find the plan likely to prevail, and since it seems to be a common impression that they succeed best in a Camellia-house, or one which has a western aspect, we feel called upon to re-affirm what we have before stated, and show how these plants are spoiled by shade.

Planted in a border which is inevitably twelve or fourteen feet from the glass, and more or less screened from the sun's rays by the surrounding Camellias; from the moment they appear above the ground to the period of their flowering, there is an unnatural effort maintained to reach the top of the house. Hence, by the month of July, the stems are considerably higher than the tallest person, and, wanting proportionate strength and foliage, this is a very displeasing characteristic in Lilies. The flowers, then, when they are developed, lack colour in the more richly mottled varieties, and are too remote from each other and from the spectator in all.

Turning to the converse case, if the plants are confined to pots, and retained in a house with a southerly aspect, they can be placed close to the glass throughout their entire growth, and perfection in height, in the arrangement, number, size, and colouring of the flowers, will be readily attained. The height, under such congenial treatment, will be from two feet to two feet six inches; the flowers will be from ten to twelve in a group on a single stem; the hues most gorgeous; and the whole a model of health and beauty. Should it be thought that our opinions on the subject are merely supposititious, we must distinctly say, that having often observed plants in both the states and circumstances noted, our description of them is quite accurate.

When proximity to the glass occasions excessive evaporation from the soil in which the species are grown, it is useful to spread over the top of the earth a layer of moss, an inch or more in thickness. The practice is adopted, though not for the purpose suggested, at Mr. Low's, Clapton, and it is found that the roots rise through the soil into the moss, and are there both more easily supplied with water, and nearer the atmospheric influences. On the moss becoming filled with roots, a little soil or other moss can be placed above it, thus encouraging the most valuable rootlets to range near the surface; the importance of which is appreciated by every scientific culturist.

Our objections to cultivating the Japan Lilies in a border, do not, of course, extend to the open ground. The main difference between the two situations is that while in the bed of a Camellia-house only vertical light could be received, which would unavoidably "draw" the plants towards the point at which it enters; in an exposed border, the plants would be encompassed with light, the comparatively equal attraction of which on all sides would counteract the tendency to grow to a great perpendicular height, and impel them to the expansion of lateral branches when in a much dwarfer state. The distinction here made is of immense moment in the culture of tender exotics, and involves consequences which are daily ensuring fresh attention.

We shall recur again and again to the subject of this article, and shall make these sketches embrace whatever novelty presents itself in the amelioration of plant culture.

ON PLANTING ISOLATED TREES.

In extensive pleasure-grounds and parks, or even in smaller villa-gardens, nothing gives so delightful an air of richness, grandeur, and antiquity, as a few noble specimens of handsome trees. They at once attract the eye from the meaner features of a place; raise an idea of durableness and permanence which is always grateful; and invest everything with a kind of charm which spreads a veil over defects, and renders the more attractive features additionally interesting.

If anything can weaken the effect of such striking objects, it is their being surrounded and their trunks partially concealed, by coarse and ragged shrubs; or their symmetry destroyed, their beauty lessened, and their health injured, by the incongruous proximity of inferior specimens. And here we arrive at the question which we now purpose lightly canvassing, viz.—how far it is politic and proper to encourage the plantation and growth of single specimens of trees on an ornamental estate.

Much might be said in favour of either solitary trees or groups; and each have, in fact, their own peculiar interest, and are alike desirable in particular localities. Two very general rules may perhaps be admitted on this point. Where the country in which an estate is situated happens to be exceedingly hilly and wild, it seems advisable that large plantations or woods should preponderate; as great masses of arboreous vegetation constitute a relief to the rugged scenery around. On the contrary, if the domain offer a variety of gently undulated glades, and the tract encompassing it be comparatively level, an increased number of isolated trees appears called for, in order to impart a greater diversity of outline, and break up the monotony that would be occasioned by forest groups.

Both these principles, however, if allowed to be accurate, will bear considerable modification. Indeed, all we seek to enforce is, that in districts where either of the features depicted is very marked, there its opposite should *prevail*; not to the exclusion in the one case of detached specimens, or in the other of judiciously varied assemblages, but just so as to make the appropriate feature most obvious from almost every point of view. There will, also, of necessity, be places intermediate between the extremes mentioned, and partaking, in various degrees, of either or both of their characteristics. For such, the hint we have thrown out is only generally applicable, and must be accommodated, in detail, according to the prevailing peculiarities.

On the arrangement of groups, with regard to the best positions for them, and the selection and association of particular kinds of trees, we are not at present to enter. Our business in this paper is with single specimens; and we will first specify one or two situations in which they would be inappropriate, then advert to the positions to which they seem most accordant, and afterwards note a few of the advantages attending this system of planting; constantly bearing in mind the two main suggestions already offered.

Detached trees ought never to be placed on the summit of a hill. It is indispensable that, wherever the sky forms the background of a scene—or, in other words, when there are no distant hills or other objects intervening between the top of an eminence, as seen from a principal or central point of vision, and the sky—or where the hill spoken of constitutes the horizon of the spectator—broad, expansive masses of wood or turf should alone be visible. And even when, for the purpose of ensuring variety, these are interspersed with smaller groups, single trees would stand out too boldly, too distinctly, and interfere too abruptly with the apparent, though irregular, continuity of the line of the horizon, to be at all pleasing. The desideratum in such instances appears to be an agreeable undulation of surface only; which is best created by the *tops alone* of intermingled spiry and round-headed, conical and fastigiated trees. Wherever, therefore, an individual tree surmounts a hill, it evidently wants a smaller one on either side of it, to render its upper or external line continuous with the turf below; otherwise its bare stems, and the reduction of its diameter towards the base, (this being precisely the part where it is required to expand,) would have a very disagreeable appearance.

Solitary specimens (with the exception of Alders and Willows) are further objectionable, but by no means to so great an extent, immediately on the margins of rivers or spacious lakes. Water and wood (the latter term being used in the sense of an aggregation of trees) are universally considered beautiful in combination; but single trees have no such effect. Grass, or plantations, which invariably ought to clothe the ground in the vicinity of artificial bodies of water, or of rivers that traverse estates devoted to pleasure, unite best with each other, or with the water, when the first is left in open glades, and the trees are congregated together in irregular groups. It is impossible, in short, to obtain that fine diversity of figure which should characterize the turf surrounding water as much as the water itself, or occasionally to hide the course or conceal the boundary of the latter, or to make, in some places, a glorious, but, nevertheless, limited, expanse of water and garden or park apparent, and, in others, to completely embosom a lake among trees, without employing plantations on a greater or less scale. Besides, the reflection of masses of trees in water is much more gratifying than that of single ones; and specimens standing alone would tend to separate the turf into petty and paltry fragments.

Again, if it be wished to exclude certain objects from the range of view at the mansion, or other prominent parts of the garden, or to shut out one portion of the estate or pleasure-grounds from another, it would be absurd, for this end, were the intermediate space extensive enough, to plant a great number of single trees; because, however they might on the whole be arranged to effect the design from one or more positions, there would necessarily be parts, especially in winter, through which the things sought to be banished could be perceived. To accomplish such intentions, close planting is the only rational method.

Having thus spoken of the spots where isolated trees should not be planted, we must treat of those to which they are most suitable. In every garden or park there are some flat or slightly-sloping pieces of turf, on which (save those immediately environing the house, and which should be reserved, to a distance compatible with the size and style of the building, for flowers, shrubs, or avenues alone) specimens of trees may be so disposed as to present aggregately a most sylvan aspect, while, at the same time, they individually invite examination and produce pleasure, keep out of sight the actual limits of a place, give an image of indefiniteness, and show to what perfection trees are capable of being brought by being grown on grass and kept apart from each other.

Probably no spot without the garden boundary is better calculated to exhibit a fine specimen tree to advantage, than the slope of a trifling park eminence, which rises sufficiently high to prevent the top of the tree from cutting the horizon. Looked upon with the light-green grass for a background, its figure, and the dark masses of its foliage, are just obvious enough to excite all the pleasurable emotions they are formed for yielding, while they do not acquire that nakedness and conspicuousness which are rather a drawback than an incentive to admiration.

The same species, however, planted in the pleasure-grounds, whether on a slope of a similar kind, or a common plane, become far more interesting, from the feathering of their branches quite down to the turf; cattle ordinarily eating the lower shoots in parks. Wherever, about a pleasure-garden, plantations were not essential, or shrubs more adapted to the locality, or beds and borders of flowers more characteristic or held in greater esteem, we would introduce glades of lawn, and plant thereon, at adequate distances, with the greatest possible irregularity, and using, likewise, the most extensive variety of valuable sorts,—including as many scarce ones as could be procured,—detached specimens of exotic trees. An arboretum of the most interesting description would thus be secured; one of the true principles of planting —*selection*—would be followed; and each tree, as it advanced, would display its proper character, and grow additionally ornamental every year.

For planting singly by the side of streams or lakes, no trees are so singularly fitted as the Weeping Willow and the Alder. The last is, from an inexplicable cause, unaccountably neglected as a water-side tree in many of our English counties; though when its trunk inclines over the banks, and its branches depend into the limpid element, few trees are more picturesque. With regard to the Weeping Willow, the most elegant of trees, the lively green of whose foliage is among the first to denote the dawning spring, and the last in the train of the receding autumn, we could name more than one princely garden, celebrated for the magnificence of its lakes and river, to which not a solitary plant is admitted. The Birch, also, that queen of the woods, so much depreciated by many who have been accustomed to it in its wild state, but so gracefully beautiful, both when decked in its summer leaves, and when clothed in the more transient dress of the winter's rime, is only inferior to the Weeping Willow for adorning the marge of a stream.

Were we to enumerate all the trees that will bear isolation on a lawn or in a park, we should have to compile a catalogue for the purpose. It must suffice to say, that none of the trees at present cultivated in this country, whether indigenous or exotic, would be omitted from the list. There are a few kinds, of which the Scotch and Silver Firs, the Larch, Yew, &c., are examples, which are too often thought to be fit only for plantations, or for placing on hills, for general shrubberies of which concealment is the object, and for woods. But if proprietors and planters could once see the effect of this sort of trees on lawns, with their lower branches sweeping the earth, and all the rest making a graceful curve downwards, and then again upwards towards the extremities, they would be convinced that though the Cedar surpasses them in majesty, it hardly excels them in sterling beauty.

Of trees common in England, there is only one which is not well adapted for solitary show; and this is the Lombardy Poplar. Undoubtedly, it is in itself a noble object, when wholly unencumbered; but it is when towering above an ordinary plantation, and its spire-like summit standing out clearly among lower and rounder-headed trees, that it impresses the beholder with its beauty, and with an appreciation of the taste of the planter who placed it there. Elms and other trees sometimes exhibit a lack of symmetry when in an isolated state; though this is entirely owing to their being overrun with shrubs or nursling plants while in an early stage of their growth. And we shall conclude with urging the necessity of keeping trees intended for specimens as perfectly free from all encumbrance from the moment of their being transplanted, as they are after having stood for half a century the pride of the estate.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR JULY.

Callistáchys lineàris. Like most of its congeners, this species is of a rambling habit, with small stems, long, linear, reticulate, and mucronulate foliage, and dull reddish purple-coloured flowers, which are borne in a terminal spike. The hue of its blossoms is unusual, these generally being yellow; but it was at first supposed to have been crimson, and has been a source of great disappointment. It was received at the garden of the Caledonian Horticultural Society, where it flowered in October last, from Mr. Low, of Clapton, by whom it had been imported from the Swan River colony, through the agency of Mr. Drummond. *Bot. Mag.* 3882.

Cymbídium pubéscens. The disposition and figure of the leaves in this species are rather peculiar, as they clasp each other at the base in the manner of an Iris, and are sword-shaped, with distinct parallel nerves. The flowers are produced on dependent racemes, which issue from the bottom of the leaves. The colour of the sepals seems to be a purplish brown, with a green margin; that of the lip is yellow, with a large brownish blotch surrounding its extremity. It has a very hairy lip, in which respect it differs from *C. bicolor;* "but it corresponds with that species in the remarkable character of a shallow bag being present at the base of the lip." Mr. Cuming discovered it at Sincapore, and sent it to Messrs. Loddiges. *Bot. Reg.* 38.

Epidéndrum Grahàmi. Apparently not much unlike *E. alatum*, though having different colours to its flowers, and wanting the broad wing-like appendages of the column. Plants in the Edinburgh Botanic Garden were procured from Mexico, and Sir W. J. Hooker has named it after Dr. Graham. It is a handsome species, having small oval pseudo-bulbs, terminated by two broadly-linear leaves, from between which the flower-stalk asçends to the height of about eighteen inches. This does not appear to branch, and the flowers are loosely disposed. They are large, with yellowish green sepals and petals, which become brown towards the points, and a long, broad, wavy lip, which is white, striped with red, and has two yellowish side-lobes. *Bot. Reg.* 3885.

Ipomœa batatoìdes. A showy climbing species, whose flowers are "so beautiful that a rival to them can hardly be found in this most lovely race. The stems do not ramble so much as some do, nor are the leaves so abundant as to overshadow and conceal the flowers; but the latter stand forward from before the foliage, and fully expand in the early part of the day." We saw it flowering about three months ago in a stove at the Horticultural Society's Garden, and the blossoms were of a hue somewhat intermediate between the richest purple and crimson.

They are large and abundant; and the leaves are deeply three to five-lobed. It was introduced by Mr. Hartweg, and is said to furnish jalap. *Bot. Reg.* 36.

Potentílla insígnis. This plant was raised from seeds presented to the Horticultural Society by the Court of Directors of the East India Company, to whom they were transmitted through Dr. Royle from the north of India. It is doubtful whether it be a decided species. The leaves are of the ordinary kind, three-parted, with serrated lobes, and hoary on the under side. The flowers are numerous, large, and of a deep bright yellow colour. It is quite hardy, may be treated as the other herbaceous species, and will probably be useful to the hybridist on account of the size and fine yellow colour of its blossoms. *Bot. Reg.* 37.

Sálvia hìans. A particularly ornamental hardy herbaceous plant, collected in Cashmere by Dr. Royle's agents, and introduced to this country by the Court of Directors of the East India Company. It is an upright-growing species, with somewhat hastate, rugose leaves, and axillary clusters of noble blue flowers, the lower lip of which is white, spotted with blue. Its average height is little more than a foot, the blossoms are exceedingly profuse, and, from the mixture of blue and white, highly attractive. Its flowering season is May and June. Young plants may be obtained by dividing the old specimens in autumn or spring, or by seeds; but the seedlings do not flower the first year. *Bot. Reg.* 39.

Schweiggèria pauciflòra. Messrs. Loddiges imported this interesting little stove-shrub from Brazil, and it has frequently bloomed in their collection. It is closely allied to the genus *Viola*, from which it is distinguished by the very unequal divisions of the calyx, and by the different form of the stigma. Its common height is from one to two feet; it branches very freely; the leaves are small, oblong, and crenate; and the flowers are solitary, on long peduncles, their principal member being a spreading white lip, which is yellowish, and streaked with pink near the bottom, and has a prominent spur. As it grows in "wet, shady, stony places, near the river Itahype, in the province of Bahia," it requires a moist atmosphere, and a rather sterile soil. The flowers are not borne in great numbers at any one period; but they develop themselves at almost every season. *Bot. Reg.* 40.

Stylídium ciliàtum. Yellow flowers constitute the principal distinction of this pretty species, which has also ciliated leaves, very beautifully arranged. These are densely imbricated; the outer ones spreading flatly, the inner ones rising erectly; each being narrow, linear, and tipped with a conspicuous hair-like point. The flower-stalks, calyx, and the exterior of the blossoms, are covered with "long, spreading hairs, tipped with a brown, viscid gland." It was raised in the nursery of Mr. Low, of Clapton, with whom it has flowered; and it will be esteemed as affording a contrast to the pink-blossomed species. *Bot. Mag.* 3883.

NEW OR INTERESTING PLANTS RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES.

Acrophýllum venòsum. Formerly known under the name of *Weinmannia*, but now more familiar by the present title. It is a handsome Australian shrub, with deeply-veined and pleasing foliage, and bearing generally large spikes of pretty white flowers at the ends of its branches, in the months of May and June. It flowered at the latter period with Messrs. Loddiges.

Antirrhìnum màjus; *var.* We observed, during the last two months, at Messrs. Henderson's, Pine-Apple Place, a very interesting variety of *Antirrhinum*, of a dwarf dense habit, and bearing small, narrow, beautifully-variegated leaves. The flowers are pinkish-purple, and in dwarf close spikes. It forms a peculiarly attractive ornament to the flower-borders.

Azàlea Gledstanèsii. A new variety, of foreign origin, flowered in the late spring by Messrs. Rollisson of Tooting. Its distinction consists in the flowers, which appear intermediate between the white and variegated blossomed tender Azaleas. They are white, with a few streaks or blotches of pink, but sometimes being destitute of any stains.

Borònia—? An exceedingly well-defined Swan River species of this delightful genus is at present blooming with Mr. Knight, of the King's Road, Chelsea. It is very dwarf and bushy, with numerous little thin lanceolate leaves, and minute pale pink blossoms. What renders it rather singular is, that the foliage has a scent exactly like that of Fennel or Tarragon.

Cirrhopétalum Cúmingii. To appreciate the beauty of this lovely little orchidaceous plant, it must be seen, as no description can properly portray its several interesting features. From small pseudo-bulbs, surmounted by neat foliage, its graceful wire-like scapes rise to the height of three or four inches, forming a crown of the richest ruby-coloured flowers, arranged so as to form a flat head, of which the large labellums are the most conspicuous objects. The column, on being touched, oscillates in the most singular manner, and the whole plant is strikingly elegant. It was imported by Messrs. Loddiges from the Philippine Islands, where it had been collected by Mr. Cuming, and flowered at the Hackney Nursery in the early part of the present year.

Clerodéndrum speciosíssimum. We notice this splendid plant in order to correct a prevailing impression that it is identical with *C. squamatum*. The leaves of the latter are of a deeper green, less round, and have none of that downiness and softness which are apparent in those of *C. speciosissimum*, and the flowers are smaller. Other points of difference are very perceptible when specimens of the two kinds are placed side by side; which step is alone sufficient to convince every one that they are decidedly distinct.

Crámbe cordifòlia. The culinary Sea Kale seems to have very little affinity, except in the form of its flowers, with this species, which is really a good herbaceous plant for large or shrubbery borders. It has large and handsome leaves, and the flower stems attain the height of four feet and upwards, but so extensively ramified, and so profusely covered with its clear white blossoms, as to make altogether a very desirable border plant. Our attention was drawn to it in June last, at Messrs. Young's, Epsom, where it was then flowering most abundantly.

CYCLÓGYNE CANÉSCENS. This showy suffruticose Swan River plant, which either appears likely to be lost sight of among the multitude of other novelties, or is yet too scarce to be frequently seen, has recently bloomed very finely at Mr. Knight's, Chelsea. The deep-purple tint of the flowers, merging to greenish towards the middle, their size, the length of the flower-spikes, and the number of these produced on a healthy specimen, give it a strong claim to be singled out from the host of other comparatively worthless plants from the same region, and carefully tended. It only requires to be kept constantly in a light greenhouse or frame, and watered with some degree of caution.

CYPRIPÈDIUM BARBÀTUM. In its prettily-mottled leaves, this new species is somewhat like another and familiar member of the genus, and the flowers are not very far remote from those of the same sort. In the sepals and petals of the blossoms, there is a pleasing mixture of white, purple, and green, disposed in parallel streaks, though the purple is more generally diffused near the edges. A delicate beard-like tuft of hairs is situated in the centre. Messrs. Loddiges have introduced it, and it flowered in their establishment during the past spring.

CYRTOCHÌLUM FÍLIPES. What renders this slender species rather extraordinary is that it has been in flower for fully four months, at Messrs. Rollisson's, Tooting, where there are blooms still expanded, and blossom-buds yet to open. It is a pretty plant, with weak stems, six inches long, incapable of supporting themselves, and bearing the flowers at their extremities. The sepals and petals are yellow, much mottled with brown, and the lip is large, conspicuous, and pure yellow. It is grown in a pot, but might be advantageously placed on a suspended log of wood.

CÝTISUS FÍLIPES. Straight erect stems, from which depend a number of thread-like shoots, destitute of leaves, and giving to the plant a "weeping" character, distinguish this charming species; which has, in several metropolitan collections, been liberally decorated with its tufts of fragrant white blossoms throughout the months of April and May. It is probably from the island of Teneriffe, and constitutes a beautiful greenhouse shrub.

GESNÈRA ARNÓLDII. A splendid plant, hardly to be distinguished from *G. Sellowii.* It has intense scarlet flowers, round the lower portion of the throat of which there is a band of bright blue. Messrs. Henderson, of Pine-Apple Place, possess blooming specimens.

OPERATIONS FOR AUGUST.

After the heavy rains which have fallen during the last month, there will be little danger of hardy plants again suffering from drought; and the attention of the culturist will now be necessary to guard them from falling into a state of extreme luxuriance. The flower-beds should forthwith be gone over for the purpose of removing all damaged or decaying flowers; the shoots of half-hardy plants should be checked where they are becoming too exuberant; and the plants in pots, that have been exposed to the late storms, ought to be examined, and the soil replaced wherever it has been washed away.

If greenhouse plants that have been placed in the open air show any tendency to make a second growth in consequence of the recent abundant supplies of water, the young shoots should be at once pinched off; for many species, when suffered to grow twice in the season, are very much weakened, and the first or natural development of all must be prevented from duly maturing itself thereby, and deprived of much of the strength which would be expended in the formation of fresh wood and flowers in the following spring. Some sorts of Heaths, which keep growing nearly all the year, are always thus treated by the best cultivators; but the operation has been too generally confined to them, and hence the numbers of straggling plants which are apparent in greenhouses.

From the shoots that are taken from Verbenas and other hardy plants to promote their fertility and render them less rambling, cuttings should now be prepared for propagation. We invariably recommend the commencement of this process at the earliest possible period, that the plants may be in some measure established and hardened before that trying season, winter, arrives; for where these points are secured, they will require far less tendance, and be infinitely less liable to damp off, or be otherwise injured. A little bark or fermenting manure, the heat of which has been half exhausted, will, if covered with a frame, be quite sufficient to give out a congenial temperature; and the cuttings should be planted in moderate-sized pots, and these plunged in the heating material. The employment of pots of this kind is preferable to the use of large ones, or to placing the cuttings in a bed of prepared soil; because, where too many of them are brought together, their treatment cannot be sufficiently discriminate, and they are apt to suffer from the general manner in which water must be applied, from the want of proper drainage, and from the large body of earth thus collected. It is well known that even in large pots the cuttings occupying the centre never succeed so perfectly as those nearer the outside; and where they are unavoidably planted out in beds, it might be serviceable to divide these into small compartments by pieces of slate or tile. With shade during sunshine, and a slight admission of air when the heat is excessive, they will speedily emit roots, and may then be placed singly in small pots, and removed to a cold frame. A trifling screen will be necessary in sunny weather till they have recommenced growing, after which they may be gradually exposed. The process should be continued until a proper stock is obtained.

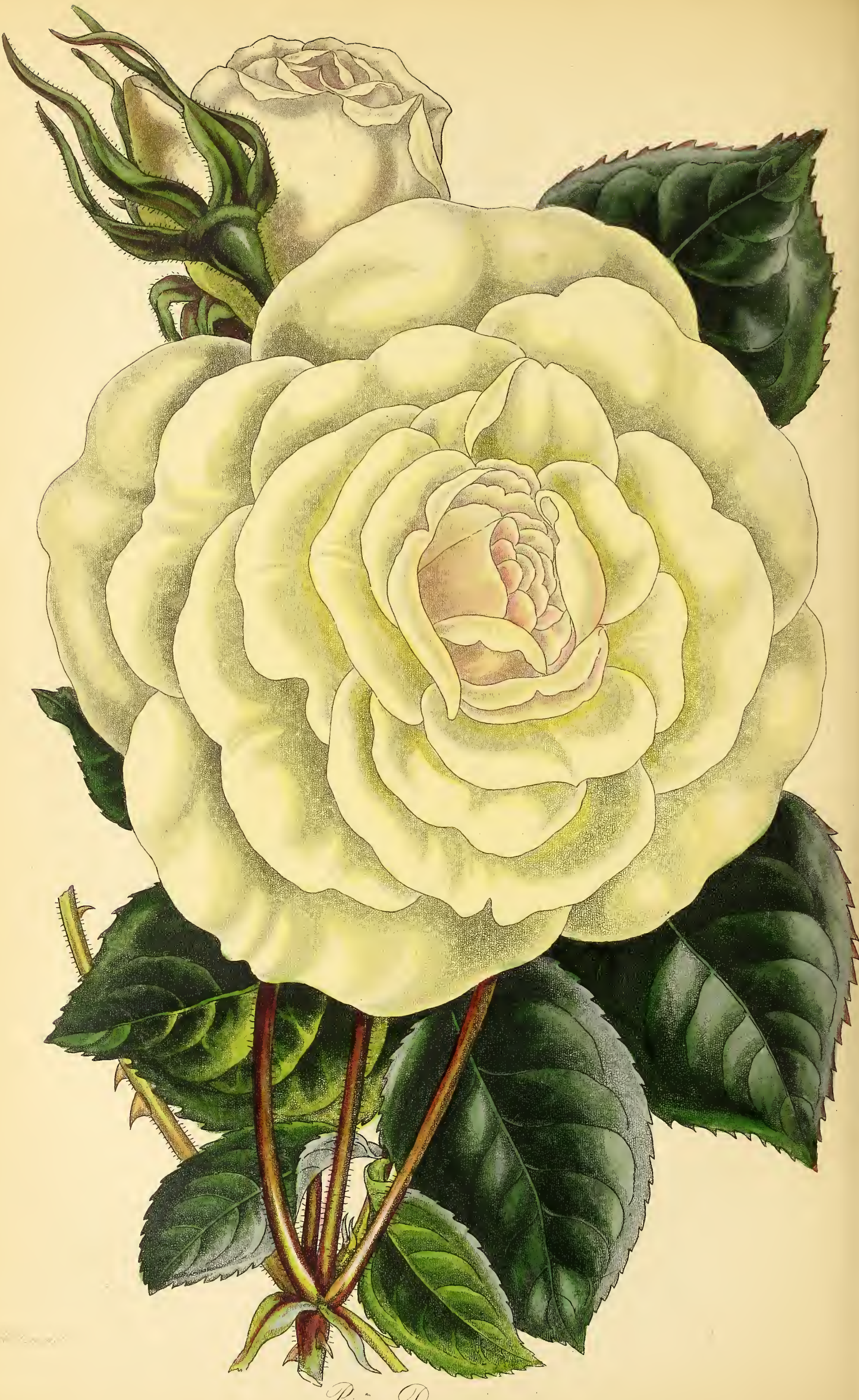
Those who desire standard Roses, or wish to have several varieties on one stem, should now attend to budding them. It is usually supposed that gardeners alone can perform this operation; but with manual dexterity, and a strict adherence to the few simple directions to be found in almost every gardening book, any amateur may command success. To vary the ordinary height of standard Roses, it will be well to bud a quantity on stocks from eighteen inches to two feet high; and these, if introduced to small flower-gardens, or planted in beds of limited dimensions, will have a very pretty effect.

Seeds should be saved at this period with the greatest care, since those ripened now will be as perfect as they possibly can be. Should the weather remain rainy, if any choice annuals or biennials are in the open ground, and seeds are sought to be obtained from them, the safest plan will be to cover them with a hand-glass, or, assuming that they are in a bed, with a frame. Nothing scatters seeds sooner, or injures some kinds more while they are forming, than pelting rains; and there is no way of guarding against these but that just spoken of, unless the plants can be readily potted and taken to the greenhouse.

Tender climbers that have been planted out of doors, and have covered the space devoted to them, should not be further meddled with except they become too wild. Training is indispensable up to this period of their growth; but as they are beginning to flower, they will hereafter look much better if the lateral shoots are left to stand out from the wall or trellis. So, with the same class of climbers in the houses, they may with propriety be allowed a greater freedom at this time. Hard-wooded species must, however, be duly kept in order.

Among greenhouse and hothouse plants, some will perhaps require repotting this month; though all shifting should be avoided where practicable, on the principle that whatever excites plants to renew their growth at this season is an evil. The stoves and all other plant-erections should be opened freely in the day-time, and a great deal of air should particularly be admitted to greenhouses, especially to those in which Heaths are cultivated. By keeping them in a perpetual current of air for the present and the succeeding month, they will not be so likely to take mildew. Syringing should be still pursued, though with less vigour.

Additional sowings of annuals may be made; Carnations should be layered, if they have not yet been done; Chrysanthemums must be tied to stakes as their stems grow, but only three or four of the strongest stems should be retained; the flowers of choice Dahlias can be thinned, to render the remaining ones finer; seedling Dahlias ought to be thrown away as soon as they are proved valueless, being great exhausters of the soil; Pelargoniums should have their growth cherished by a little warmth and atmospheric moisture; the flower-stems of herbaceous plants are to be cut off as they die; Ixias and other Cape bulbs must be kept gradually less moist; Box-edgings and other evergreen hedges may be clipped; and vacant beds can be turned over before being re-filled, but they should not be manured.



Rosa Devoniensis.

RÒSA DEVONIÉNSIS.

(DEVONSHIRE ROSE.)

CLASS.	ORDER.
ICOSANDRIA.	POLYGYNIA.

NATURAL ORDER.
ROSÀCEÆ.

GENERIC CHARACTER.—*Calyx* with the tube contracted at the mouth, and with a five-parted limb; the segments somewhat spirally imbricated at the apex in æstivation, and usually pinnately divided. *Petals* five. *Stamens* numerous. *Carpels* numerous, bony, inserted on the inside of the tube of the calyx, which at length becomes baccate, and encloses them; dry and indehiscent, bearing each a style on the inner side. *Styles* exserted from the constricted part of the calycine tube, sometimes distinct, sometimes connected into a columnar style. *Seeds* solitary, without albumen, inverted. *Embryo* straight, with flattish cotyledons.—*Don's Gard. and Botany.*

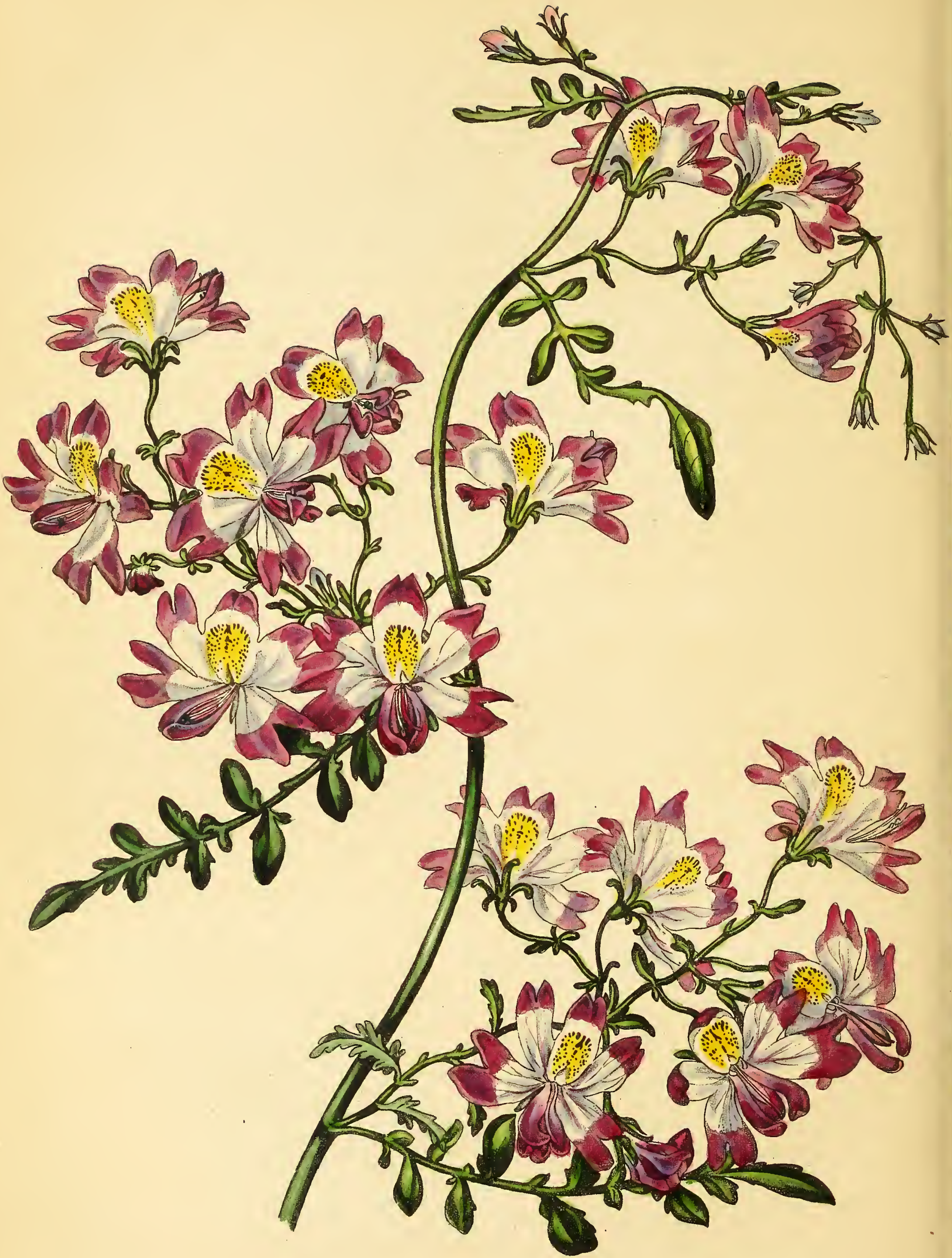
SPECIFIC CHARACTER.—A robust shrub, of hybrid origin, with very large, sweet-scented, double yellow flowers.

WITH every cultivator of the better kinds of roses, the yellow Chinese variety is a decided favourite, as well for the large size of its delicate yellow flowers, as for their beautiful form, graceful disposition, liberal production, and most agreeable odour. From that handsome plant the sort now figured was obtained by hybridization, though with what other variety is not known. It exhibits a marked superiority in its principal features, and, as will be seen from our drawing, is particularly observable for its dimensions and figure.

Messrs. Lucombe, Pince, and Co., nurserymen, of Exeter, who hold the entire stock of this splendid rose, had the accompanying plate prepared for us in their nursery last June, and inform us that it possesses a very vigorous habit, with thick, glossy, dark green foliage, and produces a profusion of flowers throughout the spring, summer, and autumn months. "The flowers," say these gentlemen, "are very large, cupped, with fine bold outer or guard petals, of a firm Camellia-like texture, very double, finely-formed, and deliciously fragrant. The colour, which when the buds first open is a creamy buff, changes as the flowers expand to a primrose yellow, with a pinkish-buff centre. Flowers exhibited at one of the meetings of the London Horticultural Society in Regent Street, were awarded the Banksian medal."

Like the yellow China and Noisette roses, "it will succeed best if planted in a rich border, and trained against an eastern or western wall. It thus stood the severe winter of 1840-1841 uninjured. It is universally admitted to be the finest variety ever introduced, and we cannot speak too highly of it."

As to the aspect of the wall on which it should be trained, we may remark, that those above indicated are not indispensable; for it will thrive well against a south or south-western wall; and might, no doubt, be advantageously fastened to a single pole in a sheltered locality. This class of roses requires very little pruning, and their young shoots ought always to be allowed to remain disengaged from the wall through the summer, since the flowers invariably appear at the extremities of the branches.



Schizanthus Evansianus.

SCHIZÁNTHUS EVANSIÀNUS.

(MR. EVANS'S SCHIZANTHUS.)

CLASS.	ORDER.
DIANDRIA.	MONOGYNIA.

NATURAL ORDER.
SCROPHULARIÀCEÆ.

Generic Character.—*Calyx* five-parted, nearly equal. *Corolla* with a narrow, short tube, and a four-parted, irregular, shapeless limb, which is plaited in æstivation. *Stamens* four, the two upper ones sterile; *filaments* altogether adnate; *anthers* inserted by the base, two-celled; cells confluent at the apex. *Ovary* two-celled, seated on a fleshy disk; *stigma* compressed, obtuse; lobes connate. *Capsules* two-celled, many-seeded; valves bifid. *Dissepiment* parallel. *Placentæ* two, spongy. *Seeds* cochleate, tubercled. *Albumen* fleshy. *Embryo* arched, with a cylindrical obtuse radicle, which is twice as long as the cotyledons.—*Don's Gard. and Botany.*

Specific Character.—A seedling plant, with irregularly pinnate leaves, and flowers of which the centre is white, and the margins a light pinkish crimson, while the middle lobe of the upper petal has a large yellow blotch, which, again, is spotted with dark spots.

At a period when hybrid, or accidental seedling varieties of various plants are becoming multiplied to such an absolutely indefinite extent, and their characters so intimately blended that it is almost impossible to distinguish them when placed near each other, it behoves those who have any influence in such matters, jealously to guard against bestowing a name on varieties that are, either through lack of beauty or distinctness, unworthy of it.

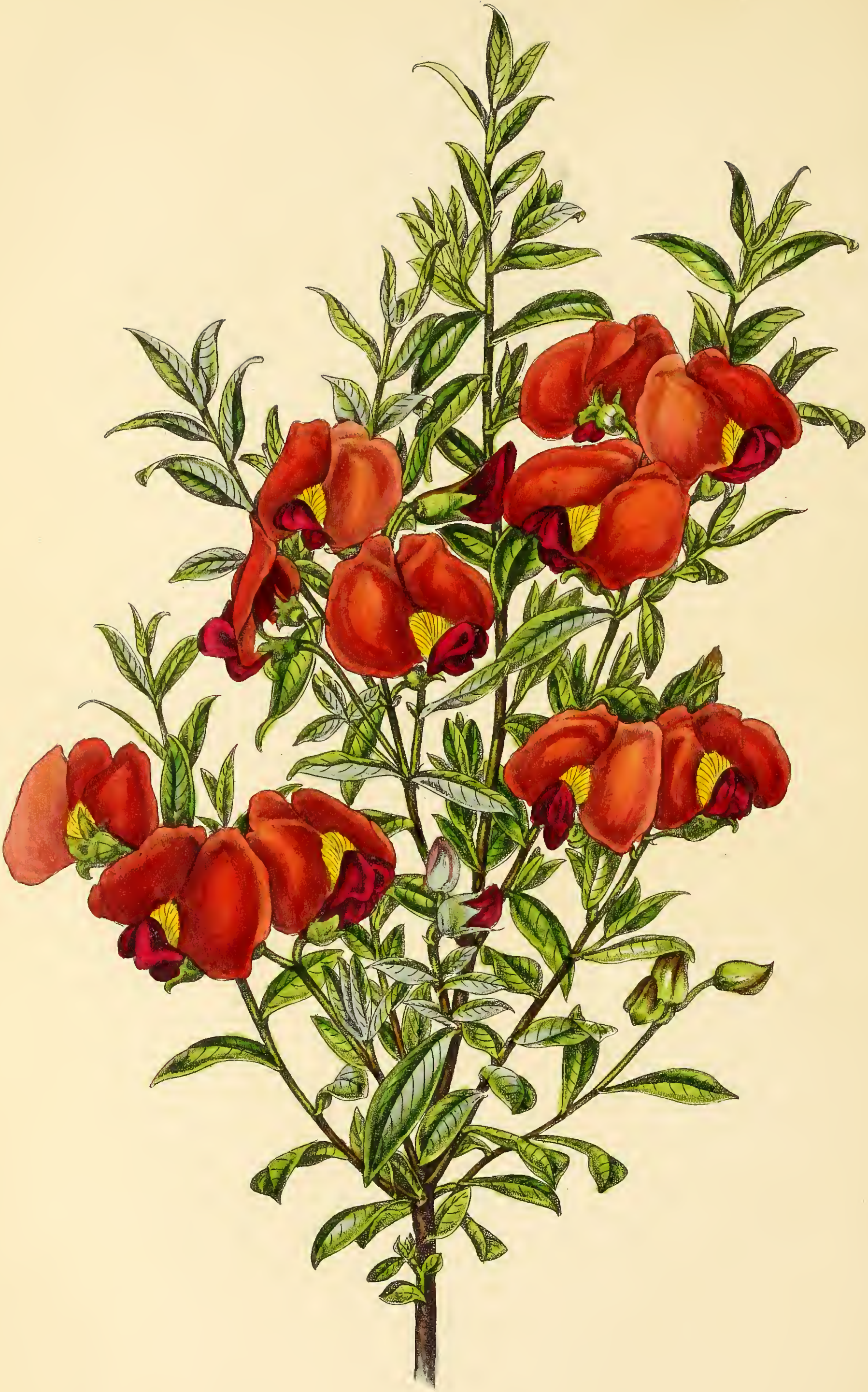
Thoroughly imbued with this impression, we had at first some hesitation in applying an appellation to the beautiful object here delineated, because, in the foliage and the shape of the flowers, it greatly resembles *S. pinnatus.* But as we have since seen that our subject, whatever may be its actual nature, has been perpetuated, year after year, by its own seeds, without varying in any one particular, this circumstance certainly entitles it to a name; and its extreme elegance will, we are persuaded, secure for it a position in the majority of collections.

It was raised in 1839 by Mr. Evans, gardener to Mrs. Batty, at New Hall, near Salisbury; but whether it is an accidental variety or an hybrid we have not been able to learn. It is unquestionably one of the most ornamental members of the genus; and thinking, as we do, that it is much better to give commemorative names to plants produced by art, or of doubtful generation, we have dedicated this to the gardener by whom it was obtained.

Plants passed into the hands of Mr. Low, of Clapton, in the year already mentioned, and our figure was taken from them about the month of June of the same year. Although it did not seed freely, owing to some casualties attending its cultivation, a few seeds were preserved, and it can now be procured at the Clapton nursery, where it has bloomed abundantly during the present season.

Seeds may be sown at different periods, according as the plants are wished to flower. The best time is probably the month of March. They can be scattered sparingly over a light soil, on a gentle hotbed, and very slightly covered; or they may be sown in pots. They should be potted singly, or with two or three in a pot, while in an early stage of their growth, and extreme care is necessary to preserve them from too great dampness. In repotting, it is advisable to disturb the roots as little as possible, for these are delicate, and the health of the specimen is entirely dependent on them.

Schizanthus is derived from *schizo*, to cut, and *anthos*, a flower, referring to the numerous indentations in the margins of the petals.



Chorozema Dicksonii.

CHOROZÈMA DICKSÒNII.

(MR. DICKSON'S CHOROZEMA.)

CLASS.
DECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LEGUMINŌSÆ.

GENERIC CHARACTER.—*Calyx* half five-cleft, bilabiate; upper lip bifid, lower one three-parted. *Keel* of the flower ventricose, shorter than the wings. *Style* short, hooked, crowned by an obliquely obtuse stigma. *Legume* ventricose, one-celled, many-seeded, sessile or subsessile.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—Plant an erect, evergreen shrub, branching freely, growing from two to three feet in height. *Leaves* usually alternate, sessile, ovate-lanceolate, mucronulate. *Flowers* axillary, solitary or in pairs, having long peduncles. *Standard* large, bright red, with a yellow blotch at the base. *Wings* and *keel* purplish crimson.

No genus of Australian plants contains fewer uninteresting species, or comprises more generally those which are positively ornamental, than *Chorozema.* Each plant composing it is more or less beautiful on account of the showy colours of its flowers, and there are a few which likewise possess a healthy and vigorous habit, while most of them may be made to assume a luxuriant appearance by judicious treatment.

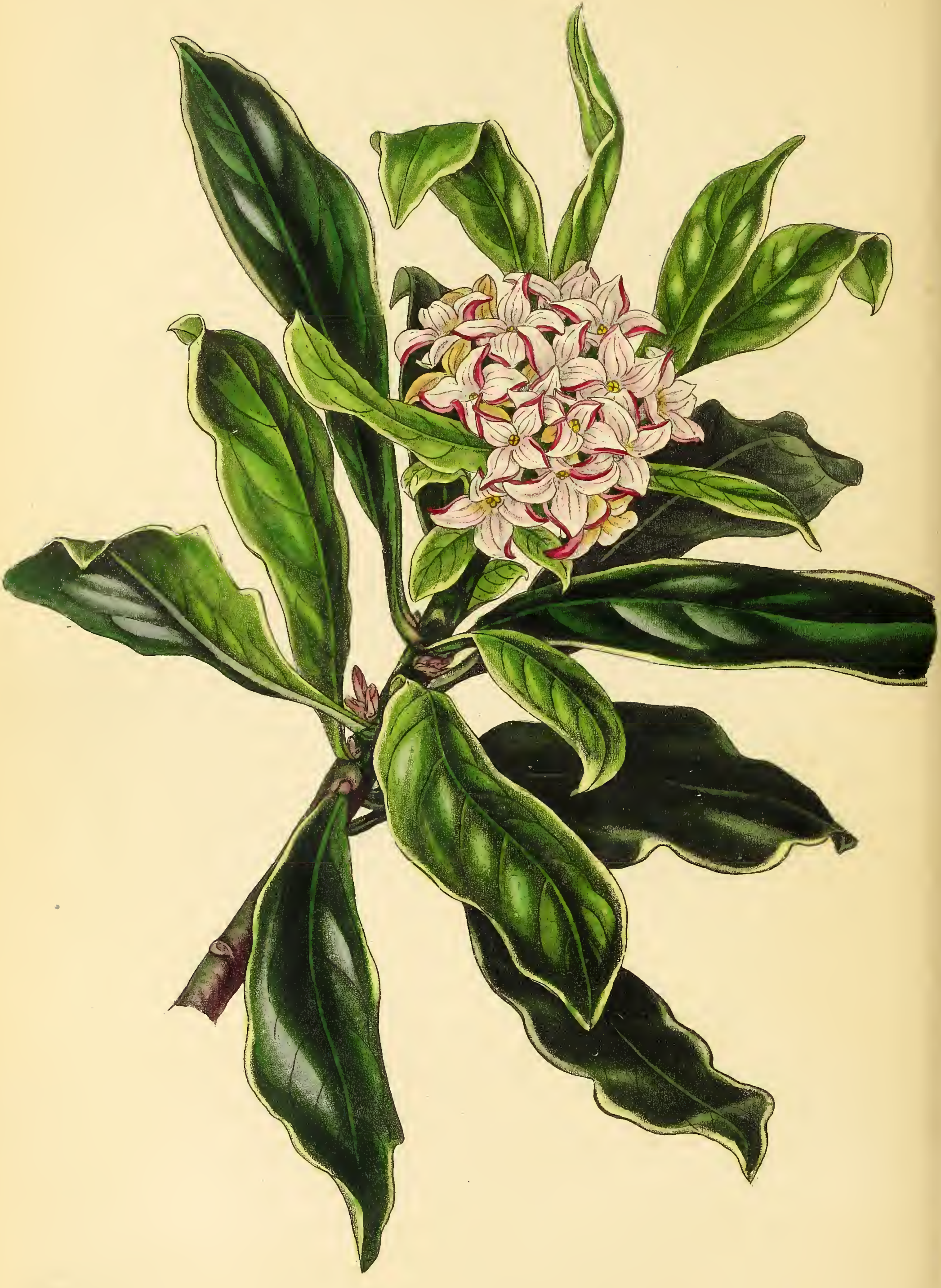
C. Henchmannii, which perhaps bears a greater profusion of blossoms than any of the dwarfer kinds, has unfortunately very meagre foliage, and its poverty in this respect is often rendered more conspicuous by the number of stakes, or the inappropriate trellis to which it is supported. If slightly pruned, and thus induced to grow in a more bushy manner, it will not need the assistance of stakes, and its aspect will be greatly improved. *C. ovata*, again, slender and weakly as it usually is, may be greatly improved by cautious pruning, and by care in the administration of water.

The present highly elegant species, which has, when properly grown, flowers fully equal to those of *C. ovata*, suffers much from neglect, and is often met with in a rambling, unornamental condition. If aptly managed, however, it displays a denseness and abundance of leaves and branches, which are well depicted in our figure, taken from a plant that flowered in Messrs. Rollisson's nursery, at Tooting, Surrey.

Its seeds were introduced from the Swan River Colony, four or five years back, amongst the numberless other seeds collected by different individuals, and transmitted to Britain. Flowers have subsequently been developed in many gardens, and it is easily procured from most nurseries. As it is rarely seen in a good state of health, or with a sufficient compactness of growth, it may be well to give the particulars of its culture in those places where it has succeeded best.

Cuttings are selected for propagation from such specimens as have flowered liberally, and are struck in the ordinary way, potting them into the smallest pots when they have formed roots. The compost should be nearly two-thirds fibrous, unsifted heath-mould, and the rest sandy loam. In repotting them when they require it, a very trifling shift will suffice, and they ought never to be placed in too large a pot, nor the roots be buried deeply, or it will be difficult to keep them from injury by superfluous water. As soon as the main shoot is three inches high, cut off the top of it, and it will then begin to branch in all directions. Treat the branches in the same manner when they have acquired an equal length, and continue the like operation afterwards, if necessary. A dwarf, bushy plant will thus be produced, which will bloom before it is six inches in height, and bear larger and richer blossoms than any straggling specimen.

The name *Chorozema* is from *choros*, a dance, and *zema*, a drink. One of the species was first discovered by Labillardiere at the base of some mountains on the south-west coast of New Holland, near a spot where, after finding numerous salt springs, his companions met with a copious supply of fresh water. The joy resulting from this discovery appears to have given rise to the generic title.



Daphne japonica.

DÁPHNE JAPÓNICA.

(JAPAN DAPHNE.)

CLASS.
OCTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
THYMELÀCEÆ.

Generic Character. — *Calyx* none. *Corolla* monopetalous, funnel-shaped, four-cleft, deciduous. Drupe one-seeded.

Specific Character.—Plant shrubby, evergreen, two feet high and upwards. *Leaves* oblong-lanceolate, acute, wavy, margined with yellow. *Corolla* purplish red without, pale pink within.

From the number of Japanese plants made known to European cultivators by Dr. Siebold, it might be expected that some definitive opinion should by this time have been gained as to their hardihood, and the probability of the commoner natives of that country thriving unprotected (or with a very little winter shelter) in our climate. And so far as experience has yet taught us, we incline to the belief that at least the shrubby forms of vegetation in Japan may be grown in the open air in most parts of Britain with complete impunity, provided they be carefully tended for the first year or two after their transplantation.

Should such be the case with the pleasing species of *Daphne* now under remark, it will add a peculiarly interesting feature to our shrubberies. It is one of the many plants collected by Dr. Siebold in his journeyings through Japan, and sent to Continental gardens, from whence it has been received by Messrs. Young, of Epsom, with the character of hardiness, and it flowered with these gentlemen in February and March of the present year.

It is particularly noticeable for the broad yellow margin of its fine evergreen foliage, and for the delicious scent of its pretty flowers, which is only comparable to a sort of refined essence of that of the leaves of *Aloysia citriodora.* The species to which it makes the nearest approach is *D. odora,* from which it may be popularly distinguished by the yellow band round its leaves. The flowers have also a much richer fragrance.

Hitherto it has been kept in a greenhouse, for the purpose of propagation; and from its scarcity, no attempt has been made to acclimatize it. It does not seem to be of a rambling nature, and bears decapitation without damage, the operation merely causing it to protrude a number of fresh lateral shoots. When it shall be planted in the open border, its leaves will doubtless become of a deeper green tint, and thus render the contrast between the green and yellow more striking.

Its multiplication is effected pretty readily by grafting it on stocks of *D. laureola*, or any hardy sort that happens to be plentiful, in the way now commonly adopted for increasing Camellias, Rhododendrons, &c. If placed in a warm, moist frame, or pit, the pot plunged in bark or manure, and the roof duly shaded, a union is soon formed, and the plant, when safe, can be gradually removed to a cold house. Where the intention is to plant it in the open ground for experiment, a hardy species should invariably be chosen as a stock.

The definition of the generic name is said to be *daio*, to burn, and *phone*, a noise, because the leaves and wood cause a cracking sound while burning.

OF GARDENING AS A SCIENCE.

NO. VIII.

We brought our remarks upon *humus* to a close at page 155, and are naturally led to the consideration of the next great natural agent—WATER. We treat it numerically as second to *earth* ; but in point of importance it ought perhaps to hold the precedence. The view we propose to take of its composition and agency may induce others to arrive at that conclusion also. Few persons, in this reading age, consider water as a simple element ; it is known by every philosopher to be a compound, consisting of the great elementary principles, *hydrogen*, two parts, and *oxygen*, one part,—both estimated by their volume or measure. But what are hydrogen and oxygen ? The simplest answer (and it is one which expresses ignorance) appears to be the following :—they are the constituent elements of water ; of that fluid which might be deemed the first of created things.

The sublime experiments of Faraday have stamped peculiar grandeur upon this all-important fluid, for they have shown that it is the standard measure of electrical developments ; and therefore his *Experimental Researches into Electricity* ought to be perused by every natural philosopher with deep attention. If into a glass globe, containing one gallon of pure oxygen gas, a very fine jet tube be introduced, connected with a vessel (a gasometer is best) of pure hydrogen gas, and the stream issuing therefrom be ignited, before insertion into the globe, or by the electric spark when inserted, the combustion of the hydrogen will be effected by the agency of the oxygen, so that by the time the whole of the latter has disappeared, two gallons of the oxygen will have been consumed, and water, to the extent of the conjoint weight of the two gases, will be deposited in the globe. The late Dr. Henry, of Manchester, described the experiment very accurately in his *Elements of Chemistry*, and elucidated it with a woodcut, to which we refer our friends. It is our present object not to enter upon chemical minutiæ, but simply to allude to phenomena which we have proved, and which may now be adduced in support of the electrical hypothesis of water. We view it, then, as the grand agent of all terrestrial meteorology ; as the depositary and medium of that elementary fire or essence which, through the primary agency of solar light, is the vital, stimulating principle of vegetable development and growth ; and coincidentally, as the instrument by which all manuring substances are brought into a condition to furnish the liquid aliment that is absorbed by the roots of a plant, and which we term sap.

It is quite certain that in dry ground, whatever be its condition as respects manure or vegetable earth, no plant can continue to thrive. Hence, persons might be apt to suppose that water dissolves the manure, and conveys it in the state of liquid manure to the roots ; and such, or something very like it, was the received opinion of early cultivators. But good soil, that which is fit for the purposes of nutrition, will not dissolve; it will not yield colouring matter to water. Therefore we conclude that the plant, under the stimulus of solar light, (which also operates on the ground, and is itself absorbed thereby—not extinguished,) decomposes the water that exists in the soil, and thus induces an electric current, which in its turn decomposes the manure, and converts it to primary raw sap. What this sap may be, it is more than possible we shall never be able to determine with precision; but we may be allowed to suggest that the elements of water are thus developed, which combine instantly, in the form of the purest water, depositing the carbon within the soil *. It is by no means asserted that all the carbon of the manure or vegetable earth is deposited; a portion may be, and very probably is, dissolved at the moment of the extrication of both, by an equivalent portion of hydrogen; but what we contend for is this—That water does not act as a direct solvent of manure, no such thing as dissolved liquid manure being taken up, nutrimentally, by the roots; and that sap, be it (according to the usual acceptation of the word) simply aqueous, or a compound of water, and some hydro-carbon, is the secondary result of an electrolytic process, nearly allied to that which we term galvanic or voltaic.

If our views be correct, there will be little difficulty to account for the darker hue assumed by ground under crop; for the carbon, being deposited, remains in it; or if we suppose with Liebig that there is a modification of humus, which is perfectly insoluble, called "*coal of humus*," the same phenomenon will occur. This coal, according to the Lecture on Manures by Dr. Daubeny, p. 250 of the Journal of the R. Ag. Soc., is derived from common humus by the gradual process of decay, but is already advanced to that condition in which alkalies or earths can neither convert it into humic acid, nor render it soluble.

In common with Liebig, Dr. Daubeny believes that humus, "during the whole period of its decay, until it has reached that ultimate point at which it ceases to be soluble, and has become a kind of *caput mortuum*, goes on continually disengaging carbonic acid; so that the roots of plants fixed in humus of this quality are surrounded by an atmosphere of the gas in question, which is therefore *held in solution by the water* taken up by them as sap."

Where is the proof that carbonic acid is so dissolved? Is it not far more likely that if this aërial acid be produced, it passes at once into the atmosphere, and thence is taken into the vegetable organization by the leaves, to be converted into specific fluids and woody fibre?

Water certainly does act as a solvent, but not of vegetable mould; as *rain*, it conveys into the earth with every shower a certain quantity of *ammonia*, which is a saline substance of extreme utility in vegetation. On this subject Liebig thus expresses himself:—"Any one may satisfy himself of the presence of ammonia in rain by simply adding a little sulphuric or muriatic acid to a quantity of rain-water, and evaporating this nearly to dryness in a clean porcelain basin. The ammonia remains in the residue in combination with the acid employed, and may be detected by a little powdered lime, which separates the ammonia, and thus renders its peculiar pungent smell sensible. The sensation which is perceived upon moistening the hand with rain-water, so different from that produced by distilled water, and to which the term *softness* is vulgarly applied, is also due to the carbonate of ammonia contained in the former.

---

* All manure, vegetable mould, &c., contains oxygen, hydrogen, and carbon; and sometimes nitrogen.

"The ammonia which is removed from the atmosphere by rain and other causes is as constantly replaced by the putrefaction of animal and vegetable matters."—"It is worthy of observation that the ammonia contained in rain and snow-water possesses an offensive smell of perspiration and animal excrements,—a fact which leaves no doubt respecting its origin."

We shall have occasion to say more of ammonia when we consider the products of vegetables; it will suffice now to remark that nature has herein provided a corrector of what would, like atmospheric carbonic acid, become a deadly nuisance, and, by bringing down ammonia with the rain, converts it into a solvent of vegetable manure, fitted for laboration by the vital principle.

This ammonia, and also the potassa in the loams, and other saline substances, are *bonâ fide* dissolved by water, and thus duly conveyed by the absorbents of the roots into the *organism.*

Rain-water, when fresh, is known to be soft; but it becomes rather hard in tanks lined with cement, probably by the abstraction of some of its ammonia—a defect which a very small portion of ammonia added to the water will immediately remedy.

Common hard water from wells contains calcareous matter dissolved by an excess of carbonic acid. By exposure to air some of this acid escapes, carbonate of lime (chalk) is deposited, and the water is improved; but for the purposes of horticulture nothing can be compared to the water derived from rain which flows through pastures into a pond that has a clay bottom. It is soft, replete with every soluble matter adapted to the nourishment of plants, and far preferable to any that can be obtained from artificial, confined depositaries. Possessing a natural fluid of so excellent a quality, the gardener will have no occasion to trouble himself with manure-water or any other offensive applications, the results of which, to say the best of them, are ever doubtful, and certainly, at times, very pernicious.

CULTURE OF A FEW ORNAMENTAL PLANTS.

In the desultory observations which we are now about to lay before our readers, two great principles will be found to be constantly regarded. First, no plant will be spoken of that is not really ornamental, and highly worthy of the cultivator's attention; and next, the systems of treatment propounded will be those best calculated to enhance the beauty of each subject, and to display it advantageously. On these accounts, the culturist who only grows a few of the best kinds of plants, may rely on our notices as indicating some of those best adapted to his purpose.

Brachycome iberidifolia is a new and very pretty annual, lately introduced from the Swan River Colony, and likely to be much in request during the ensuing season, as it has already been in the present. Although we have seen the flowers nearly white, and varying in shade from that to lilac and deep bluish purple, the commoner tint is very dark blue. Far too much artificial heat has hitherto been applied to it in most places during germination and the earlier periods of its growth, and the consequence has been that scarcely anywhere has it manifested a fitness for adorning the open borders, plants that have been so turned out exhibiting a sickly, miserable appearance, and producing very inferior flowers. If treated as a border annual, it ought to be raised at the ordinary time, viz. about the month of April, and be planted out in May while quite small, and rendered as hardy as possible previously. Plants removed from the greenhouse to the beds of the flower-garden when nearly full-grown, cannot be expected to succeed, as no tender annual will bear such a sudden change of circumstance, and the check of transplantation, at that period of its progress. The graceful character of this species, however, and the number of stems it produces, recommend it as a very appropriate ornament to the greenhouse in the summer months ; and if kept in this situation, it will always be most interesting ; for, owing to its slenderness, and to the changeable hue of its blossoms, exposure to rain, wind, or sun, invariably injures it to a greater or less extent. When thus retained in pots, it should be kept continually on an elevated stage of a house through which air can freely circulate, and not allowed to grow in a weakly or straggling manner. By frequent shifting, in a common compost, it may be brought into pots of a moderate size, and, when six inches or a foot in height, will be as much or more in diameter, and bloom beautifully through the middle months of the year, while other kinds of flowers are usually rather scarce in the greenhouse.

From this comparatively new annual, we advert to others which have become as familiar as the oldest ornaments of our gardens, but which have not yet been applied to an end for which they are eminently suitable. Those who adopt the grouping system of management in flower-gardens, and fill each of their beds with one sort of flower, need not be reminded of the difficulty of procuring plants to bloom in the early spring months, or rather in that period which intervenes between the development of the earliest flowers and the blooming of spring-sown annuals, or exotic herbaceous plants. There are a quantity of annuals, however, which, though commonly considered tender, and incapable of enduring the cold of our winters, succeed admirably when sown at a proper time, and come into flower in April, May, and June. When we mention that the lovely *Nemophila insignis* and others of similar habits stood through the last severe winter in an exposed border with complete impunity, it will at once be perceived that there need be no further hesitation about subjecting any Californian or North American annual to the like exposure.

The best period for sowing annuals that are intended for spring-flowering is the month of August, or early in September, as those instances of success which have occurred to us have for the most part been from self-sown seeds, which have doubtless been scattered nearly at that time. The seeds should be very lightly covered, or only worked into the soil with a rake, and not be sown too thickly, because, when the young plants have to be much thinned, the remaining ones will be weak and inevitably damaged in some degree. On the other hand, they must not be sown very sparingly, as it is desirable that the plants be near enough to each other to allow of some dying in the winter, and also to form a covering to the soil, which shall assist in protecting the roots. Unless sown in pots, (which is a troublesome and unsatisfactory process at this season,) and kept in frames through the severest weather, no autumn-sown annual should ever be transplanted, for they never recover sufficiently that vigour, and that firm establishment in the earth, which are essential to their preservation, if in any way transferred from the spot where they germinate. They may be thinned to two or three inches apart, leaving the strongest and healthiest, and best-rooted plants; and if it should appear, as winter advances, that their roots are so near the surface as to render them liable to injury from winds or other circumstances, a mulching of soil can be carefully laid over the bed. We must especially urge the removal of all weeds that may spring up around them, since we observed, this spring, a few specimens of *Nemophila insignis*, which had been surrounded with weeds through the winter, and of which the flowers were not more than one-third the size of those that grew on an unencumbered soil. In the spring, all that will be necessary will be to train the branches of the living specimens over those places where any may happen to have perished, and the display of blossoms will be most brilliant and durable.

A transition from annuals to climbing shrubs may appear rather abrupt, but, as we do not here confine ourselves to any particular class of plants, we have next a few remarks to make on the Trumpet-flowered evergreen Honeysuckle, *Caprifolium sempervirens*. This species, and its several varieties, have a much superior habit to the commoner kinds, and their flowers, being of a bright crimson or scarlet, and very elegantly disposed, are exceedingly attractive. There is a fine hybrid in the Epsom nursery, generally called *C. Youngii*, which was raised, we believe, between *C. sempervirens* and *C. pubescens,* and which has larger foliage than the former, with a dash of yellow in its flowers. And there is likewise a variety of *C. sempervirens* in the same establishment, which was received from the Continent, and described as having semi-double blossoms, but which has a peculiarly rich scarlet corolla, the interior of which is so marked with orange as to give it the appearance of an additional row of petals or segments. The last, for the handsomeness of both leaves and flowers, and their incessant production throughout the finer part of the season, is perhaps unrivalled among hardy climbers.

At the nursery of Messrs. Young, Epsom, there is a considerable number of climbing plants supported by single poles, and their effect is most delightful. Among the rest may be observed specimens of the species and varieties we have just mentioned, as well as of *C. pubescens*, *etruscum*, and others. The natural habit of honeysuckles being to climb up the stems of trees, this mode of treatment is far more congenial than training them to walls and trellises; and the flowers are much more abundant, as well as additionally interesting, when protruded all round a central stem or support, than when standing out from a flat surface. Nevertheless, it might be objected that as they have a tendency to barrenness of stem, at least in the lower part, this would greatly detract from their beauty.

In a state of wildness, it is true that many Honeysuckles rise to the height of ten or more feet without producing a solitary branch, but this habit is entirely due to the circumstances of shade and seclusion from light in which they are necessarily placed, and the disposition consequently induced to rise beyond such conditions. Besides, all climbers naturally assume a rambling mode of growth, and it is only through the aid of art that they are rendered compact and restricted. If, however, a Honeysuckle be planted in an exposed position, where it can receive the full influence of sun and air, and be relieved of the prejudicial shade of trees, its proneness to attain a great elevation will be considerably checked, because it will not thus have to follow an imperative law of nature, which impels it to seek light and air, nor will that undue elongation of parts which is well known to accompany partial darkness be imposed upon it. If, in addition to these reliefs, it be assisted by slight pruning, by twisting the stems round the pole, or occasionally arranging them in a wider circle than that formed by immediate contact with their support, they will speedily protrude lateral shoots from within a few inches of the base to the summit, and, by shortening these, may be made to flower in prodigious quantities. The principal management requisite is to keep them pruned, and the tendency of the stems to become bare repressed, from the period of their transplantation to the time when they arrive at full perfection. No desire for them to gain a certain altitude must be permitted to interfere with those objects; as, if once suffered to straggle, they can never afterwards be properly reclaimed.

With *C. sempervirens* and its varieties, there is less difficulty than with any other in adopting the course of treatment now propounded. One or two of the leading stems or shoots should be fastened to the pole, and, as they advance, care should be taken that all the lower portion be duly furnished with lateral branches. As in the training of fruit-trees on walls, the main shoots must not be allowed to ascend till a sufficient proportion of side-shoots is supplied, and pruning ought to be repeatedly resorted to until that end is attained. The laterals, again, of all the kinds, can be reduced in winter, so that each will bear a greater number of young shoots in the following summer, and for every bunch of flowers produced in one season, there will thus be several in the ensuing year. We may add, that for planting on a lawn, for placing in the centre of a flower-plot, for mingling with shrubs and tall herbaceous plants in a low shrubbery, or for forming pillars or avenues of pillars in front of a conservatory or other garden building, we know nothing that has such an enchanting aspect as some species of *Caprifolium* attached to isolated poles.

GARDEN ARCHITECTURE.

Whatever ministers to the intellectual gratification of mankind, and evinces a superiority to the considerations of utility and profit, is indisputably to be regarded as a token of advancing refinement. And hence, when we see private individuals of all grades bestowing a portion of their income on the culture of plants which produce no pecuniary return, we deduce the pleasing fact that the nation (not aggregately alone, but as respects the individuals composing it) is in a higher state of civilization than it has ever before reached; the appreciation of beauty, without reference to substantial advantage, being the most striking evidence of mental culture.

As far as this state, however, is displayed in the erection of houses for the cultivation of exotic plants, we have lamented, in a previous paper, that it should yet be generally in such a meagre condition. The object, as we understand it, of all attempts to conserve tender or tropical plants by means of glazed structures, is not merely to ensure their protection from cold, wet, or other injurious external circumstances, although the attainment of these ends is of acknowledged importance. Plant culture has a higher aim. It is an endeavour to realize a yet more beautiful and prolific state than even that which is apparent in the native localities of the subjects of attention; and to arrange them in such a manner, as well as bring around them, as much as practicable, such congenial features, as shall tend rather to heighten than depreciate their own peculiar charms.

But this is only one of the rules which should guide the culturist in the construction of his greenhouses and stoves. Another, of almost equal moment in pleasure-gardens, is the aspect such structures present from the spots at which they are visible, and the manner in which they harmonize with the scenery immediately surrounding them. Now, while temples, arbours, grottoes, &c., are usually placed in natural and proper positions, and made to accord, in some degree, with the distinctive features of an estate or a scene, conservatories, in their different forms, are too frequently built where convenience dictates, and consigned to some retired portion of the pleasure-grounds, where their seclusion, or their proximity to out-houses and frame-yards, is considered a sufficient pretext for rendering them, in whole or in part, unworthy of the garden, and of the purpose for which they are destined.

Decidedly thinking that these erections should, in themselves, be conspicuous and ornamental features of a garden scene, and that they should occupy distinguished positions, both as regards style and situation, among the other objects of art assembled in a domain, we very strongly exclaim against their being reduced to so subordinate a station. As we have, however, in the article already referred to, explained our principal objections to the present prevailing style, or want of style, we shall treat of a few of the leading points to be kept in view in the formation of conservatories. The nature of our work, and the clear and explicit declarations previously made, will suffice to preclude the idea that we refer to any other houses than those appropriated entirely to flowering plants, and situated in the pleasure-grounds, or at least in an ornamental part of the garden.

One of the most prominent preliminaries to the erection of a conservatory, or a group of plant-houses, is the choice of a suitable site. The structure may be absolutely beautiful in itself; it may be exceedingly well adapted to the kind of plants to be grown in it, and altogether unexceptionable in its character and details: but if it be in an unduly elevated or depressed spot, if so placed that it can be brought into comparison with either superior or inferior buildings, if the area around it be too limited and bounded by walls, or if the tract environing it be in a rude and half-natural condition, with a roughness and ruggedness of surface which betoken a too great remoteness from the mansion, its good characteristics will entirely lose their effect.

Our first assumption, under this head, is that the house or houses in question should not be distinctly perceptible from the dwelling, and certainly not from the lowermost rooms, or those in the daily occupation of the family. It will probably be admitted as a principle that every edifice in a garden should constitute a centre, near and around which the character and disposition of everything should be, to a great extent, correspondent. There are two ways in which this design is to be effected, differing according to the nature of the buildings. Thus, a mansion is to be encompassed with lawns, walks, flower-beds, trees, or plantations, in so far as either or any of these may agree with its style; but there must be outlets through and beyond them, at intervals, by which the park, the distant country, and the many interesting objects in or within sight of the estate, may be advantageously viewed; and so, while whatever is most suitable is placed directly about the house, it is not so shut in that it may not be witnessed from other parts, or that every variety of scene may not be discerned from it, but is left sufficiently open to admit of both these ends being answered.

Again, if temples or other erections are so placed as to be visible from the house, it is indispensable that they partake more or less of its style, in proportion to their nearness, and be made of similar materials; otherwise the congruity and unity of the entire scene is broken, and a motley assemblage, devoid of real beauty, is the result.

On the other hand, there is a kind of edifice, which may be of a character totally opposite to that of the residence, that requires a more complete and decided isolation, and must be situated in a spot where its own influence alone can be felt, and where it is quite unassociated with buildings of another description. This class includes the conservatory, in all its numerous varieties.

Many reasons might be given why conservatories (in which term we may once for all say that we include every sort of floricultural erection) should not be within the range of vision at the mansion. A few only will here be mentioned. We have said that structures of a different style, and formed of dissimilar materials, interfere with the unity and expression of a scene in the vicinage of a residence. With conservatories, this is especially the case. Their outline is as remote as possible from that of a mansion, and the quantity of glass they contain renders them strikingly peculiar. Their object and size, too, are so very inferior to those of a dwelling, that, while they cannot, from their remoteness, be deemed its appendages, they are too insignificant to stand within view of it as independent structures, and the proximity of each weakens the effect of the other; for whatever, of a similar nature, distracts the attention from a great work of art, however beautiful the former may be in itself, always suffers immensely by comparison, and lessens the pleasure derivable from the contemplation of the superior subject, unless the one be so despicable as to exhibit the other in a better light by contrast.

A still more powerful objection may, however, be urged to the association in one view of a dwelling and a detached conservatory or group of conservatories. If the intermediate space be properly disposed, and walks, lawns, flower-plots, or flower-gardens be in direct connexion with the house, taste demands that these features should gradually merge into the more natural, diversified, and uncultured characteristics of the distant pleasure-grounds, and the park or meadows by which they are circumscribed. The same taste further requires, that flower-gardens, or flower-beds, on a smaller scale, should be attached to the conservatory; and when this is visible from the house, two equally stringent rules are brought into complete collision. Indeed, instead of becoming more bold in proportion as it falls away from the mansion, the garden would thus pass into a decidedly more artificial and incongruous state, on account of the limited dimensions to which everything would have to be contracted in order to harmonize with the smallness of the conservatory buildings.

If we have insisted rather strongly and at length on the necessity for keeping the conservatory sufficiently remote from the mansion not to be visible therefrom, it is because we deem the establishment of this principle essential in respect to the situation of such a building; and any violation of it would at once strike at the root of what we have further to advance. Of conservatories connected with the dwelling, we shall simply observe that, with reference to the cultivation of plants, they are barely to be tolerated, and that no gardener who loves to excel in his art can regard them with complacency, except for a very few kinds. Wherever they are erected, glass roofs are a *sine quâ non;* and they should always be incorporated with the building in some way, and not be added to it as an appendage.

Other points relative to the proper site for a conservatory are, that it ought to be in a rather level portion of the garden, but slightly elevated, itself, above the surrounding surface; that, while the area in which it stands must not be encompassed by walls, nor its actual limits apparent, it is, nevertheless, needful that it be of ready access from a coal-yard, for the purpose of supplying it with fuel; and that the ground, for some distance on all sides, be suitable (or capable of easily being made so) for flower-beds, and for plantations of shrubs and trees to enclose the whole. A word or two on each of these matters seems desirable.

First, we assert that it is better to build a conservatory on a nearly level spot, because both a hollow and a hill are inconvenient and improper. A position in a low valley, or near running water or lakes, is unsuitable from its greater dampness and coldness; and if the ground assume an actual concavity of surface, it is yet more inappropriate as contravening the universal ideas of fitness. A considerable eminence, again, will be too exposed to cold or violent winds; there will be a difficulty in conveying to it what is requisite, and it will render the building disagreeably prominent from various other parts of the garden. A plain, on the contrary, which is midway between a valley and a hill, offers the most eligible site; and the house should be on a raised platform of earth, one or two feet above the ordinary level, in order to give it a more commanding aspect.

That it utterly destroys the beauty of an erection, particularly of a garden one, to have it enclosed, on any side, by plain or even ornamented walls, must be obvious to every one who has noticed the subject. Fully as we are of opinion that conservatories should be secluded amidst flower-plots and lawns from the rest of the garden, we would rather see them exposed than confined by artificial objects. And here we must state that the main improvement we advocate in the form of such structures, is their being constructed according to the plan invariably pursued with dwellings of any pretensions: that is, as the latter are exposed to view on all sides, and are made of the same materials and with the same care in all their exterior parts, while the department assigned for offices is concealed by trees and shrubs; so the former should be alike open to inspection on all points, save that where the furnace is situated, where they may be quite as easily shrouded in similar plantations.

To preserve this openness round a conservatory, and at the same time retain it at a convenient nearness to some part of the boundary to the pleasure-grounds where coals can be deposited, and the plants taken for potting, extensive plantations will be necessary to hide the walls or other unsightly things that will necessarily be in the neighbourhood. If it can be so contrived that conservatories be brought within a short distance of the kitchen-garden, where fuel is always kept, and sheds are ever at hand, a great advantage will be gained.

The last condition we have named is, perhaps, necessarily involved in the first; a fitness for the plants and shrubberies being a natural consequence of levelness. We wish here, however, just to give a hint on the arrangement of the ground. Our view of the matter is that it should be very like that of the surface on which the mansion stands, only on a less expansive scale; the nearest space being covered with flower-beds, cut in the turf, or intersected with small gravel-walks, and these gradually passing into clumps, scattered over the lawn, and finally being bounded by an irregular plantation. The size of this area must vary with that of the buildings. Where it is unavoidably small, and on the side of a hill, a series of terraces may perhaps be the most tasteful accompaniment; and whether on an elevation or otherwise, a moderately broad walk should always pass round the building.

The form and details of the erection will hereafter be discussed.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR AUGUST.

Bérberis coriària. A new Nepal species, introduced by Dr. Royle in 1835, and flowered in the gardens of the Horticultural Society. It has the habit of the common Berberry, but is most allied to *B. asiatica*, (another Nepalese kind,) from which "it differs in its finely-veined leaves, and larger flowers." The foliage grows in clusters, is lanceolate, green on both sides, generally entire, but sometimes having sharp serratures. The fruit is red, and destitute of bloom. It is a hardy shrub, blooming in June, and readily increased by seeds, which should be sown directly they are ripe. *Bot. Reg.* 46.

Bignònia speciòsa. Mr. Tweedie, of Buenos Ayres, found this handsome plant in Uraguay, and sent it to Woburn Abbey, from whence it was forwarded to the gardens of the Caledonian Horticultural Society, and flowered in the stove in April and May last. The leaves are opposite, each having two leaflets, with a long tendril between them. The leaflets are large, elliptical, undulated, and bright green, and the flowers, which are borne erectly and in terminal pairs, are like those of *B. capreolata*, though larger, and of a lilac or deep pink hue, with darker veins. It is well adapted for training along the rafters of a stove. *Bot. Mag.* 3888.

E'ria armenìaca. Remarkable for the conspicuous orange-coloured bracts in which the flowers are partially enveloped before their expansion, and which retain their paramount interest even after the blossoms are developed. The last are of a dingy brown outside, and greenish within, with a crimson-tipped lip. The species bears strong spikes, and blooms profusely. It was imported by Messrs. Loddiges from the Philippine Islands, where it was discovered by Mr. Cuming, and has flowered in the Hackney collection. *Bot. Reg.* 42.

Gesnèra bulbòsa. The mode of growth, and the form and colour of the flowers of this splendid plant are not materially different from those of a class of species which may be exemplified by *G. Cooperii*. It appears, however, to produce as many as twelve or more blossoms on one peduncle, and to be exceedingly prolific of inflorescence. The tuber, likewise, is of a roundish figure. It was received by J. Allcard, Esq., from Brazil, and blossomed magnificently in the stove of this gentleman in October 1840. The ordinary treatment of the genus is appropriate. *Bot. Mag.* 3886.

Oncídium monocèras. Somewhat related to *O. raniferum* and others, but having a stronger flower-spike, larger, furrowed, one-leaved pseudo-bulbs, and a singular little horn on the upper side of the labellum, "curved upwards, and almost as long as the lip itself." It has greenish sepals, yellowish petals, blotched with brown, and a deep yellow lip stained with red towards its base. "It was sent by Mr. Hunt from Rio Janeiro to His Grace the Duke of Bedford in September 1839, and it flowered in great perfection in January of the following year." *Bot. Mag.* 3890.

Oxális fruticòsa. A curious instance of a shrubby species in a genus which, though extensive, is composed principally of herbaceous plants. The ordinary trifoliate character of the leaves in *Oxalis* is, moreover, seemingly departed from in this species; but the three little leaflets sometimes seen at the extremities of what would be regarded as leaves are, in fact the true leaves, while the prominent, nerved, leaf-like expansions beneath them are only dilated petioles. It is an interesting shrub, bearing its pretty yellow flowers rather numerously in the axils of the foliage. Its native country is Rio Janeiro, and it has been cultivated successfully in the stove of His Grace the Duke of Northumberland. Its propagation is effected by cuttings, or by a careful division of the roots. *Bot. Reg.* 41.

Physiánthus auricòmus. The stems of this showy climber are densely covered with yellow hairs, whence its specific name. It is of a robust climbing habitude, with spacious hairy leaves, and numberless clusters of white, sweet-scented blossoms, which expand in succession, and are elevated on stiff peduncles, issuing from the axils of the leaves, or from the opposite side of the stem. Dr. Graham observes that he "first saw this handsome climber extending across the rafters from end to end of a stove in the garden at Hales, near Liverpool, the seat of — Blackburn, Esq., in October 1837. It was covered with blossom, each flower remaining long in perfection." The country it inhabits is not accurately known, but it is supposed to be from Brazil. Specimens planted in the border of a stove flower much finer than those grown in a pot. *Bot. Mag.* 3891.

Sálvia tubífera. A desirable acquisition from Mexico, where it was discovered by Mr. Hartweg, and transmitted to the Horticultural Society. It is now in most of the principal nurseries, and produces exceedingly long spikes of beautiful purplish flowers. Its habit is like that of the suffruticose species. "It forms a bush about three feet high, branching and well covered with leaves, and at the end of every one of the branches there appear the long racemes of slender purple flowers, which are so disposed as to form a drooping or curving ornament. Like all the small-flowered Mexican kinds, it is not fit for planting in the open border during summer, as it only flowers at the latter part of the autumn, and in the winter months." A frame or greenhouse is consequently necessary for its culture, and it is multiplied by cuttings. *Bot. Reg.* 44.

NEW OR INTERESTING PLANTS RECENTLY IN FLOWER IN THE PRINCIPAL SUBURBAN NURSERIES.

Borònia vimínea. Already noticed at p. 165 of the last Number of our Magazine, but without a name. It has since flowered very profusely at Mr. Low's, Clapton, and as the flowers are exceedingly numerous, and are produced throughout an almost indefinite period, their smallness is thus in some degree compensated. The habit is very elegant.

Catasètum laminàtum. A very curious plant, with half-drooping spikes of greenish brown flowers, the form of which last is quite peculiar. The lip is whitish in the middle, and hollowed out down each side of the centre so as to leave a conspicuous ridge. It is blooming in the Orchidaceous house of Messrs. Rollisson, Tooting, but, like the rest of the genus, is not particularly attractive.

Catasètum deltoídeum. Usually called *Myanthus deltoides*, the species of which genus are now united to *Catasetum*. Its sepals, petals, and labellum are of a greenish brown ground, and prominently marked with transverse bands and blotches of dark brown. The shape of the lip at once distinguishes the species, as it is very manifestly triangular, or nearly so. A plant of it is flowering with Messrs. Henderson, of Pine-apple Place, and it is rather more interesting than some species of *Catasetum*.

Dendròbium sulcàtum. Ome of the many fine Indian species which have been added, within the last few years, to those previously in cultivation. Its stems are stout, about nine inches high, enlarging upwards, and becoming prominently furrowed after the leaves have fallen. The flowers are developed in drooping racemes, of from five to ten or more blossoms, and are of an orange colour, with a dark brown blotch on the lip. Though not of quite so brilliant a shade, nor unfolding so flatly, as those of some other species, they are extremely showy. Messrs. Loddiges had flowering specimens in May.

Dendrochìlum filifórmis. Belonging to a new genus, of which it is the sole species with which we are at present acquainted, and being, moreover, remarkable for its long waving flower-scapes, so thickly covered with blossoms, this plant will be valued by the devoted amateur ; but it has nothing which would impress a common observer. It has small oblong pseudo-bulbs and leaves, and the scape, which at first takes a nearly perpendicular direction, and afterwards becomes pendent, is singularly attenuated, while the flowers are ranged very regularly along its sides. They are greenish yellow and minute. Messrs. Rollisson have lately had it in flower.

Echevèria pulverulénta. The most noticeable peculiarity of this species is, that the leaves, flower-stems, calyxes, and even the upper part of the exterior of the petals, are covered with a powdery glaucous matter. In habit, it is most like *E. gibbiflora*, but the leaves are not so large. The flower-stems grow several feet in height, and the flowers are of a reddish tint, slightly tinged with greenish white on the outside. Plants of it are blooming in the stove of Messrs. Young, of Epsom; and it is believed to be a native of Mexico, or of South America.

EPIDÉNDRUM PHŒNÍCEUM. Flowers of this noble plant were opened, two months ago, with Messrs. Loddiges, who obtained it from Cuba. They remained expanded many weeks. It is a pseudo-bulbous species, with a particularly healthy aspect, having moderately large, roundish pseudo-bulbs, and very long scapes of flowers. The latter have a trifling resemblance to those of *E. macrochilum*, but are even superior. They are produced on a branching spike, are of considerable size, and have deep pinkish purple sepals and petals, with a paler border, and a fine pink lip. The species has few rivals among Epidendra.

GESNÈRA —— ? A new species of Gesnera is flowering in a stove at Messrs. Rollisson's, Tooting. It was imported from Brazil, and has long, narrow, serrated leaves, with pretty red blossoms, which are spotted with yellow towards the top, and covered on the outside with dark red processes, or clusters of hairs. It is somewhat similar to *G. elongata* in habit.

LÍLIUM ATROSANGUÍNEUM; *var.* MACULÀTUM. This magnificent Lily is only separated from its species by having the flowers mottled with a lighter hue. The general colour is a deep, rich, indescribable orange-red. It lately blossomed at the nursery of Messrs. Young, Epsom, and is invaluable as a border-flower.

MARIÁNTHUS CÆRÙLEO-PUNCTÀTUS. One of the most interesting and graceful of greenhouse climbers, beginning to bloom in the month of May, and continuing till the present period. The stems are slender, the leaves small and narrow, and the flowers are protruded in large clusters on long peduncles. They are of a light blue tint, spotted in the middle with a darker hue. It has decorated the greenhouse of Messrs. Henderson for several months.

NEMÈSIA FLORIBÚNDA. Where a bed of white flowers is wanted for the flower-garden in July and August, it cannot be better filled than with this delightful little annual; which has the appearance of a *Linaria*, of dwarf habits, with great numbers of pretty white blossoms, the centre of which is yellow. It is flowering most prodigally at Messrs. Rollisson's, and elsewhere.

ODONTOGLÓSSUM PULCHÉLLUM. Messrs. Rollisson bloomed this exceedingly elegant Orchidaceous plant in the month of April. It has long, narrow, lined leaves, and flowers, about an inch in diameter, which are almost entirely white, the column alone having a yellow front. This last organ bears a singular large reflexed lip-like appendage, and the labellum is quite minute.

PAXTÒNIA RÒSEA. Messrs. Loddiges have this year bloomed in great perfection a specimen of the species here mentioned, which had sprung up accidentally from seeds ripened and scattered in their Orchidaceous-house. The occurrence of this circumstance opens quite a new field in the propagation of the species, and it is difficult to say how many more Orchidaceæ might not, by impregnation, be increased in the same manner.

OPERATIONS FOR SEPTEMBER.

The cultivation of flowers, except in those cases where success is purely accidental, and with which, under the same treatment, failure is just as likely to be experienced on a future occasion, is seldom attended with the desired results, unless what we would call a preparatory mode of management is adopted. We use this term as signifying, that it is by preparing plants beforehand for what they may be expected to be called upon to endure, that the most satisfactory consequences will be realized.

As an illustration in point, let us refer to the winter which will soon be stealing upon us, with its possibly long-protracted rigours, and the utility of now bringing each specimen into such a state as will best capacitate it for sustaining those rigours without detriment. If, upon the occurrence of a lengthened and severe frost, it be discovered—as it most likely then will be if proper precautions be not taken—that certain plants are in a succulent and feeble condition, from excess of moisture or superfluity of growth during autumn, it will then be in vain that measures are employed to improve them. But if, in anticipation of such a circumstance, the culturist now bestirs himself, and checks all additional growth, besides keeping every plant from becoming too moist, he will thus act the part of a true philosopher, repress the evil in the bud, and at a time when alone it will yield to his efforts, and save himself much extra trouble, as well as anxiety and chagrin.

In pursuance of this practice, it will now be necessary to watch all Heaths and other greenhouse small-wooded shrubs that may be breaking into a second growth, or beginning again to develop shoots, after having been before decapitated, and to pinch off every branch as soon as it is half an inch or an inch long. This plan cannot be too strongly advocated. Water, too, should be less liberally given to all kinds of in-door plants, particularly to those of a succulent character; and the chief object should be to keep them from flagging, without ever exciting them to grow. Air and light, also, must be allowed to act freely on most species, in order to harden their wood, and assist in inducing a state of repose. But it is injudicious to leave the lights of houses or frames off constantly, either during the day or night, as heavy showers which may be falling at this season, or any continuous rain, would injure the plants by saturating them with water.

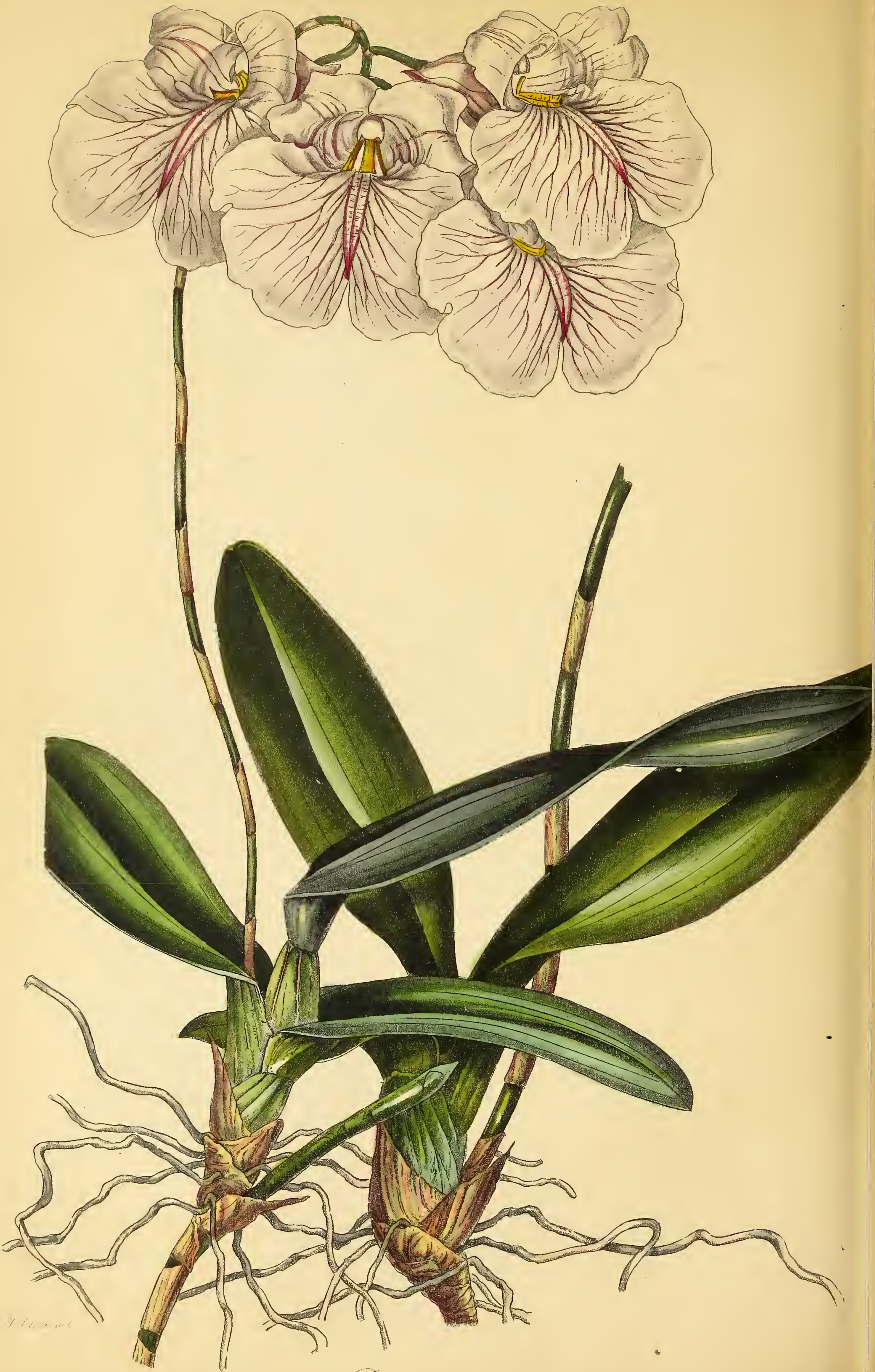
To carry out further the system already proposed, all greenhouse or stove species which have been exposed to the open air ought at once to be housed; not that it is yet becoming too cold for them, or that there is positive danger from nocturnal frosts, but because the dampness of the atmosphere and the fall of rains may bring the soil into that wet, sodden condition which it will be so difficult to relieve it from, and which is so much to be deprecated. Whatever tender plants, of which it may be desirable to retain the old specimens, happen to have been transferred to the borders, must not be left in the ground later than the middle or end of this month, since it is important that they be established in the pots before the commencement of wintry weather. In taking them from the soil, they should be deprived of a considerable portion of their roots, provided they are not destined for large specimens, and planted in comparatively small pots; (*i. e.* the smallest that will contain them,) and placed in a shaded place till they have recovered themselves sufficiently to be put where they are intended to remain.

The propagation of half-hardy perennials must likewise be continued with vigour during the present month. With Verbenas, it will be better to layer a quantity of the shoots by simply burying a part of them in the earth, about an inch or two from the extremity, and they will form roots without any further aid. Most other kinds should be increased by cuttings, and those already rooted ought to be potted, and hardened with all possible expedition.

Gesneras, Gloxinias, and those tuberous, bulbous, or herbaceous plants which naturally lose their stems and leaves about this period, should be encouraged to shed them, as soon as they exhibit an inclination to do so, by a gradual decrease in their supplies of water. Many kinds, if stimulated incessantly, will retain their foliage, or produce new, and by this means will be prevented from flowering next year; so that it is important to observe when it will be prudent to suspend their fluid nourishment, which will usually be a short time after the flowers have fallen.

Pelargoniums, which have been cut down, repotted, and have made their new developments, should now be hardened, and their growth matured to the greatest possible extent. They may be best kept in frames, the lights of which can be removed when the weather is not wet or foggy. Cacti, too, should at once be taken from the hotbed frames where they have or ought to have been placed during summer, and set in a dry greenhouse, or a house of a similar temperature which is devoted entirely to them. They should be watered sparingly, and many sorts, such as the species of *Opuntia*, some kinds of *Cereus*, and most of the Epiphylla, will flower stronger, or have their flowering propensities sooner elicited, by exposure in fine weather.

Seeds must still be collected with the greatest vigilance and care; annuals may be sown for spring-flowering; shrubs, bulbs, &c., intended for forcing, should be got in readiness towards the close of the month; all plants in pots which are unhealthy from stagnant water and improper drainage are forthwith to be shifted, that they may be re-established by the arrival of winter; budding may yet be effected, if it has hitherto been deferred; biennials can be sown in the reserve-garden; the shading should be removed from the Orchidaceous-house; dead or dying annuals should be cleared away from the flower-borders; and propagation may be carried on wherever requisite, though it is not a fit time for that operation, save in cases of necessity.



Burlingtonia rigida

BURLINGTÒNIA RÍGIDA.

(RIGID-STEMMED BURLINGTONIA.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

Generic Character.—*Perianth* membranaceous, convolute, oblique. *Sepals* unguiculate, shorter than the labellum, distinct from the petals; lateral ones concave at the base. *Petals* unguiculate, parallel with the labellum, equal in length to the sepals, but broader. *Labellum* likewise unguiculate, two-lobed, horned or pointless, dilated at the apex, with a channelled claw, lamellate. *Column* cylindrical, conspicuously club-shaped, sometimes with two coloured acute appendages at the top; clinandrium dorsal; stigma horned on both sides. *Anthers* one-celled. *Pollen-masses* two, excavated at the back, having a subulate, elastic, adnate caudicula.

Specific Character.—*Plant* epiphytal. *Stems* terete, rigid, very hard, erect, proliferous at distant intervals. *Pseudo-bulbs* obovate, compressed, one-leaved. *Leaves* oblong. *Scapes* long, rigid, racemose at the summit. *Sepals* and *petals* white, tinged and veined with pale pink. *Labellum* pointless, with few plates on the disk. *Column* pubescent, with two falcate, erect, ear-shaped appendages on the top.

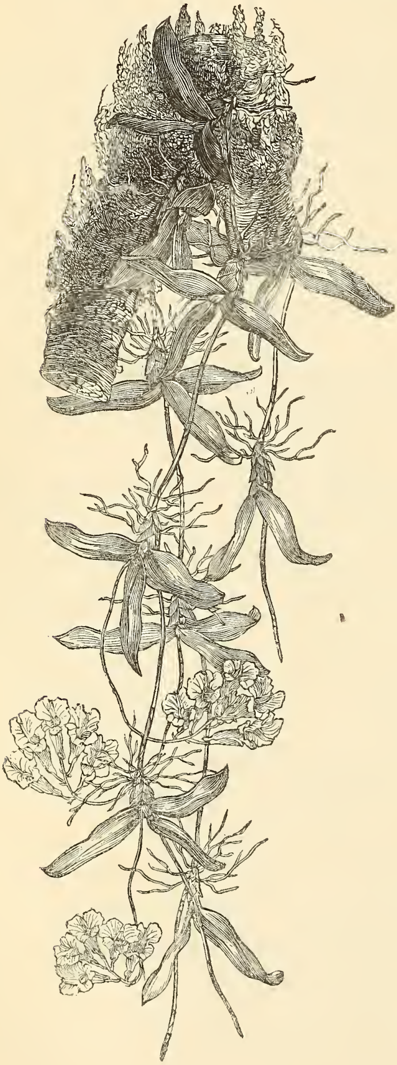
The extraordinary gracefulness of the habit of this plant, and its peculiarly lovely flowers, are almost unrivalled even in the tribe to which it belongs, and which is so singularly prolific of elegant objects.

Most Orchidaceæ that are remarkable for their strictly epiphytal character, and for sustaining themselves solely on atmospheric supplies, receive the popular name of air-plants; but there is usually a grossness and succulence in their stems, leaves, and roots, which foster the idea that these are themselves the reservoirs of nutriment, and diminish the seeming singularity of the manner in which they are sustained. To no plant does such a notion appear more inapplicable than to the present subject of remark. The smallness of all its parts, and the comparatively gossamer nature of its roots, most efficiently confirm the opinion that it is constantly dependent on the air for its existence, and render it more like a thing of romance, than an actual member of the vegetable kingdom.

In Messrs. Loddiges' magnificent collection, where our drawing was prepared last spring, there is a specimen of this beautiful plant which has attained a considerable size and perfection; and its mode of growth, which is partly exhibited in our figure, may be deemed worthy of a brief description.

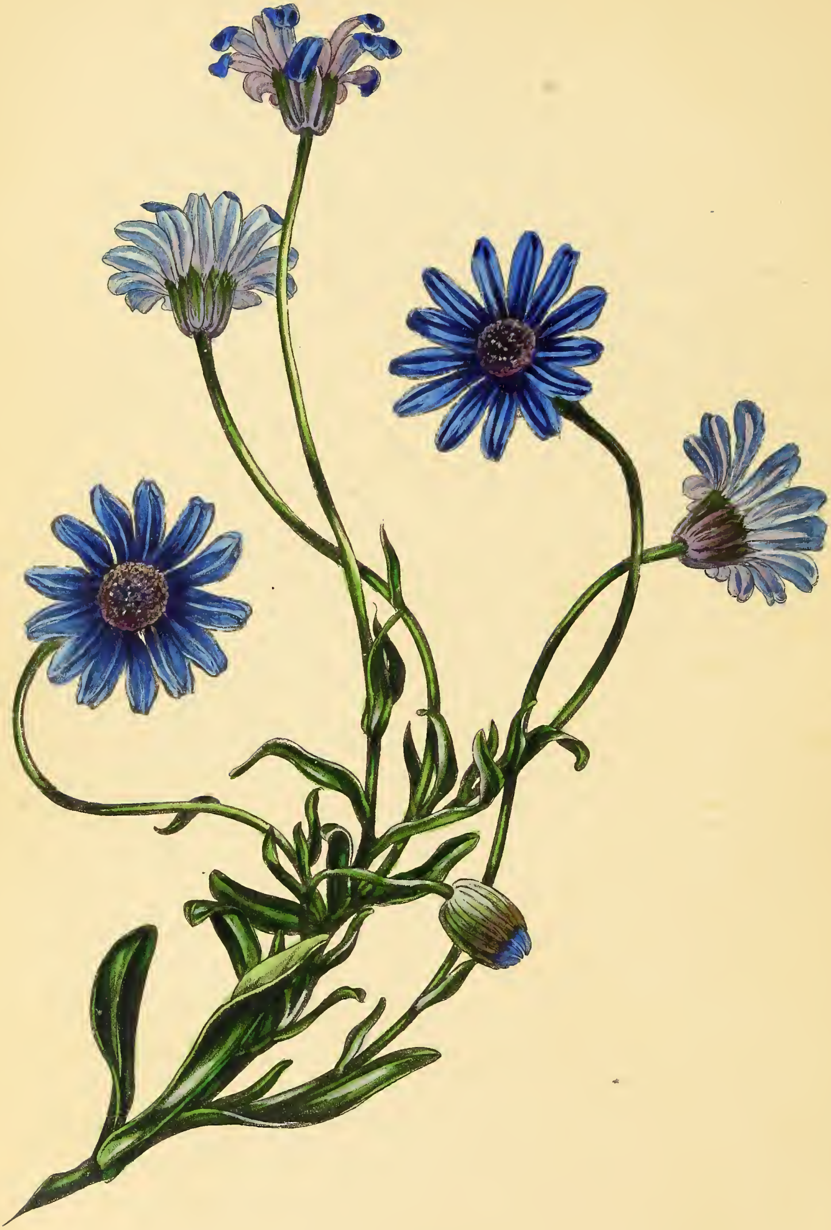
The plant, consisting of several pseudo-bulbs, is growing in a pot filled with heath-soil and potsherds, and from each of the pseudo-bulbs a long, rigid, wire-like stem ascends, developing a new bulb at its summit; and from around the base of this bulb a quantity of roots depend, which are very little thicker than a strong thread, of great length, most pleasing diversity of form and direction, and a snowy whiteness. Each year another stem arises above the last-formed pseudo-bulb, again producing a new bulb and its attendant roots at its apex; and as these stems are attached to a barrel-shaped wire trellis, the effect of the whole is in the strongest degree delightful.

When the specimen acquires an age and condition suitable for flowering, the scape is protruded from the sheath which envelops the base of the youngest pseudo-bulbs, and rises erectly for four or five inches, being yet more gracile than the stems, and bearing near its summit three, four, or more large pinkish-white blossoms. These are expanded about the month of April, and continue open many weeks.



No particular treatment is demanded. The best way of managing it, however, is to place it in a wire basket containing sphagnum moss and potsherds, and suspend it in the lower part of the house; if hung too high, it will lose much of its interest. It must be kept in a moist, warm, shaded house while growing, and in a more moderate temperature and drier atmosphere during winter. It can be propagated by severing the stem just below the uppermost pseudo-bulb, and treating the latter as an independent plant.

The genus was dedicated by Dr. Lindley to the late Countess of Burlington, a lady of whom it is needless to say more, than that the admirable species which bear her name furnish a peculiarly significant memorial of her character; and that both will be cherished after the present generation has passed away.



Kaulfussia amelloides.

KAULFÙSSIA AMELLÒIDES.

(AMELLUS-LIKE KAULFUSSIA).

CLASS.
SYNGENESIA

ORDER.
SUPERFLUA.

NATURAL ORDER.
COMPÓSITÆ.

GENERIC CHARACTER.—*Calyx* simple, equal; sepals fourteen to sixteen, lanceolate, obtuse, membranaceously marginate, with a strong blunt midrib, keeled. *Corolla* rayed. *Florets of the ray* female, copious, close, ligulate, with a filiform pubescent tube, and an oblong or revolute limb, thrice crenate at the top. *Germen* compressed, wedge-shaped, shortly pedicellate, with the pedicel fixed in the foveæ of the receptacle. *Style* hardly longer than the tube. *Stigma* bifid. *Pappus* none, or a fringe of very short hairs. *Florets of the disk* hermaphrodite, tubularly funnel-shaped, usually incurved; tube pubescent, limb five-parted, spreading. *Anthers* co-ordinate, connate. *Germen* as in the flowers of the ray. *Style* the length of the tube of the flowers. *Stigma* bifid, revolute. *Pappus* plumose. *Receptacle* naked, prominent, alveolate.

SPECIFIC CHARACTER.—*Plant* annual. *Stem* branching from the base, about six inches high. *Branches* spreading, tortuous, covered with rigid hairs. *Leaves* alternate, sessile, lanceolate-spatulate, mucronulate, with very small remote teeth, hairy on both sides. *Flowers* terminal, pedunculate, slightly nodding. *Calyx* hairy. *Florets of the ray* blue; those of the disk deep violet.

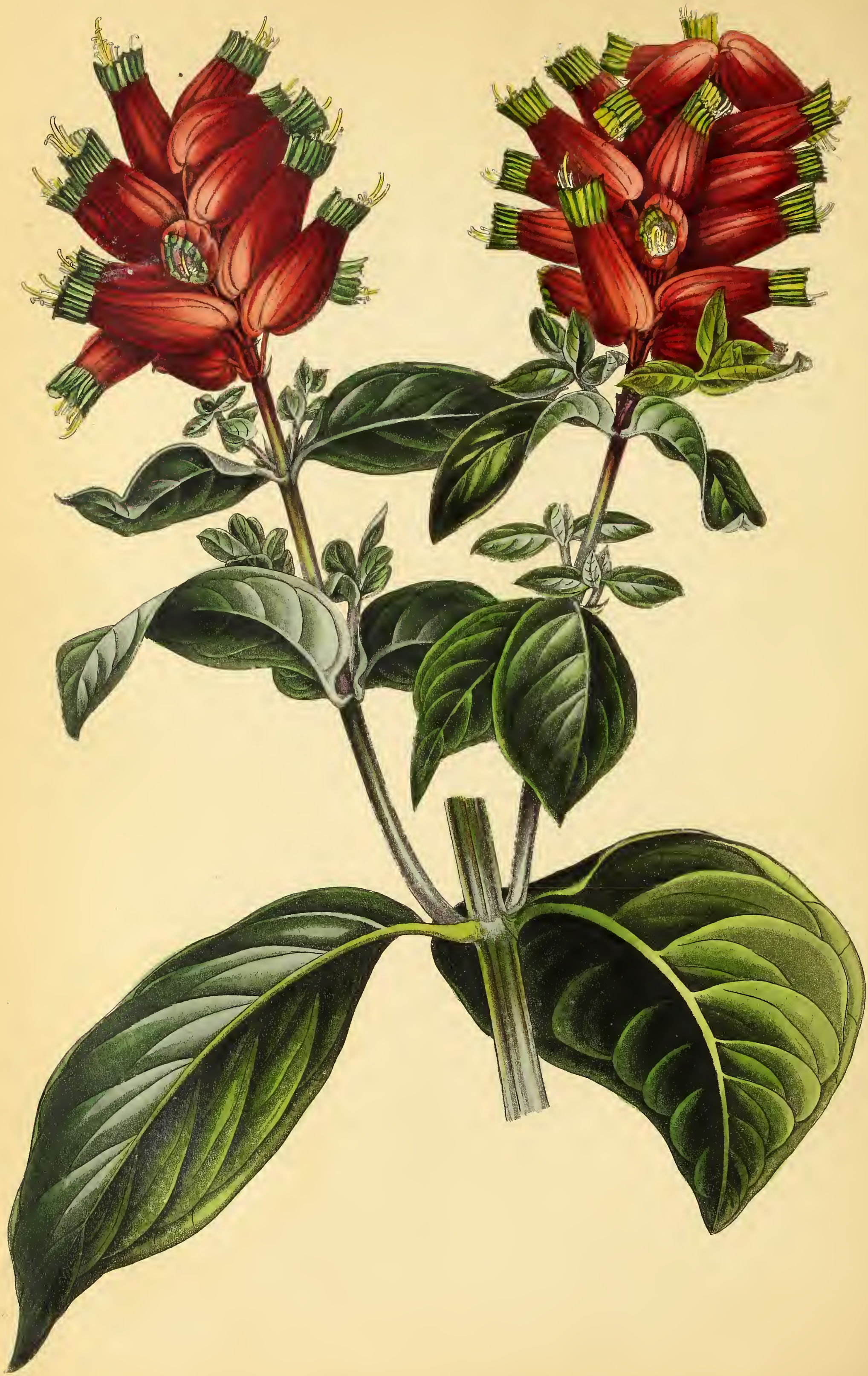
MUCH attention having been excited, during the present season, to a beautiful blue-flowered annual, *Brachycome iberidifolia*, which is of recent introduction from the Swan River settlement, we have thought it desirable to give a figure of one which was never, even when it had all the charm of novelty to recommend it, sufficiently made known, and has since almost ceased to be cultivated in the majority of gardens.

Kaulfussia amelloides constitutes a portion of the same natural and artificial groups as *Brachycome*, and has flowers which are not very dissimilar in either size or shape. But their resemblance does not extend beyond these points. The *Brachycome* is a plant which, as we have lately remarked, is most suitable for growing in pots; its delicate structure not being adapted for exposure, and the slenderness and length of its branches rendering it incapable of standing out in rainy or windy weather without being broken and damaged. *Kaulfussia*, on the other hand, is of a more robust habit, with partially trailing stems, well calculated for covering a bed in the flower-garden, or for planting in small groups in any of the flower-borders. In the colour of its blossoms it is rather more brilliant than the best varieties of *Brachycome*, and when nicely grown, bears at least an equal profusion of them.

In thus comparing an old with a new plant, our object has been to bring the former more into notice on account of its being superior, in some of its characters, to its more favoured rival, and more readily applied to a purpose for which there is a great demand. The most appropriate way of treating our subject is to sow the seeds on a gentle hotbed, or in a pot plunged in a hotbed, about the month of March, and plant the young seedlings either singly or by threes, in small pots, nearly half filled with potsherds or moss. They should be gradually hardened, kept in a cold frame, and potted as they may require, till they begin to show flower, when they may be planted, with the ball of earth entire, in the bed or border where they are to flower, and the first flower-buds must be removed. They will in this way bloom most prodigally in June and July. If intended for the borders alone, they can be raised on a hotbed, and planted out as other tender annuals.

The species was obtained from the Cape of Good Hope by Mr. Anderson, of the Chelsea Botanic Gardens, in the year 1820. It was flowering abundantly with Messrs. Henderson, of Pine-apple Place, last July, when our drawing was taken.

The genus is dedicated to Frederick Kaulfuss, M.D., Professor of Botany at Halle, and no other species has yet been added to British collections.



Cuphea Melvilla.

CÙPHEA MELVÍLLA.

(MELVILLE'S CUPHEA.)

CLASS.
DODECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LYTHRÀCEÆ.

GENERIC CHARACTER.—*Calyx* tubular, gibbose at the base on the upper side ; limb wide, twelve-toothed, with six of the teeth erect, and the other six small or nearly obsolete, rising from the sinuses of the inner teeth. *Petals* six or seven, unequal. *Stamens* eleven to fourteen, rarely six or seven, unequal, inserted in the throat of the calyx. *Gland* under the ovarium thick. *Style* filiform. *Stigma* simple, or rather bifid. *Capsule* membranous, covered by the calyx, one or two-celled, at length cleft by the deflexed placenta as well as the calyx. *Seeds* nearly orbicular, compressed, wingless.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* perennial, herbaceous. *Stems* numerous, erect. *Leaves* sessile, lanceolate, attenuated at both ends, scabrous. *Racemes* terminal, simple, many-flowered. *Calyx* red at the base, and green at the apex. *Petals* wanting.

SYNONYME.—*Melvilla speciosa.*

THIS handsome old plant, which was introduced from Essequibo, in British Guiana, about the year 1823, is now subjected to most unmerited neglect, and cultivated only in those gardens where ornament is the standard of selection. To rescue it from this position, and render its beauty more generally appreciated, are our intentions in here bringing forward a figure.

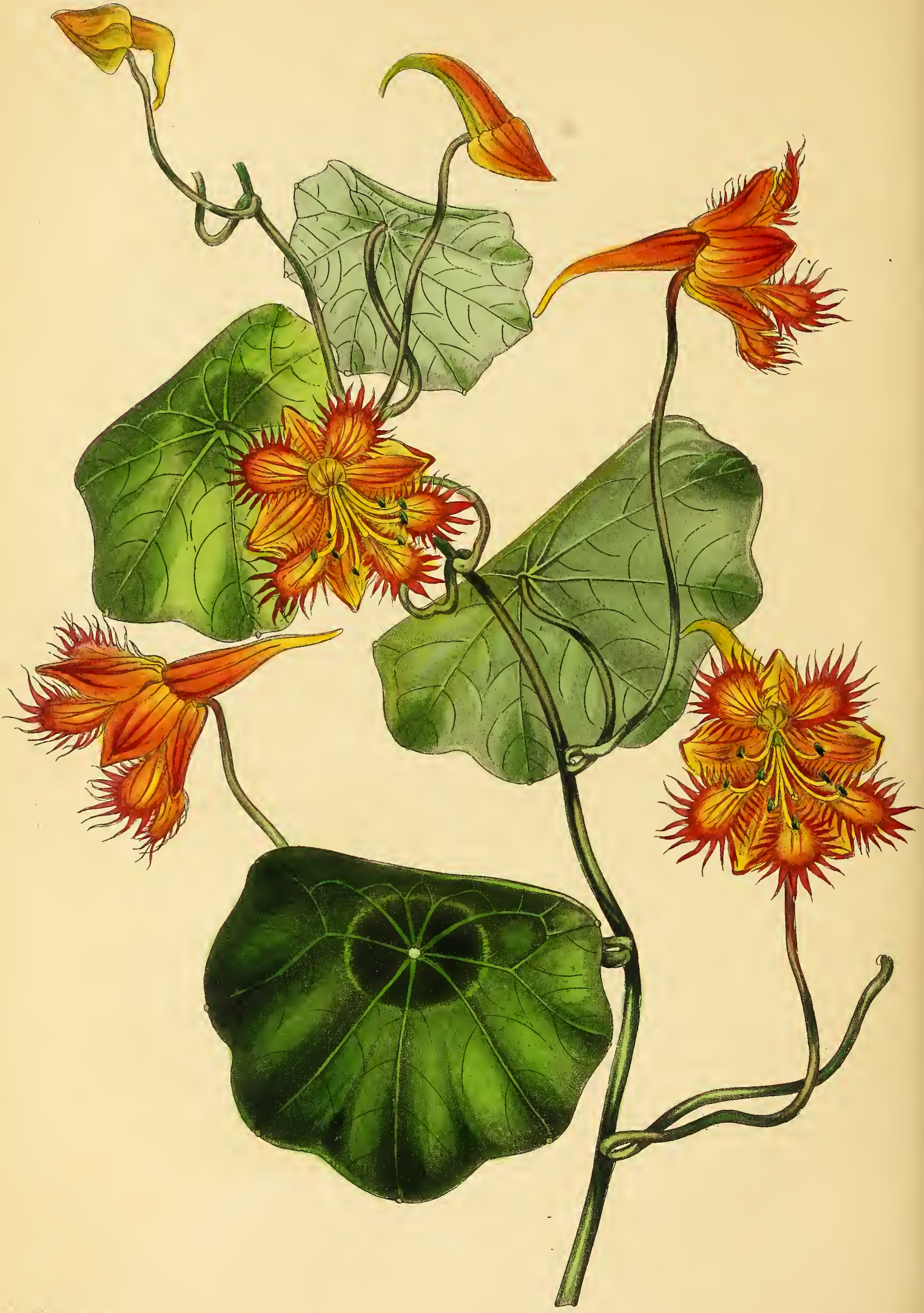
Being an herbaceous perennial, it is exceedingly like *Salvia splendens* and other species in its manner of growth, as well as in the appearance, as respects figure, of its showy blossoms. Its stems are, however, so much more numerous, almost all of them bearing a cluster of flowers at the summit, that it makes a better display than any *Salvia;* and it has the additional recommendation of blooming from May or June till August and September, or even later. The flowers, too, are both curious, as being composed solely of a coloured calyx, without any petals, and interesting, from the fine combination of crimson and green which they exhibit.

The mention above of its native country, will show the reader, that although we have compared it to a Salvia in some particulars, it requires a higher temperature than the ordinary species of that genus. A decided stove-heat is not, nevertheless, to be considered indispensable; and it will flourish with the greatest vigour in what is termed an intermediate house, or one in which the average temperature is midway between that of the stove and the greenhouse. It was in such a structure that we met with it in great perfection last autumn at the gardens of Madame Rothschild, Gunnersbury Park, where it is cultivated very successfully by Mr. Mills, the gardener, and from whence we were permitted to procure the accompanying representation.

In the stove of Mrs. Lawrence, Ealing Park, we have also observed most luxuriant specimens, with upwards of fifty distinct stems, all regularly arranged so as to form a globular mass, and most of them finely in flower. It is potted, each spring, in an enriched loamy soil, shaking off the greater part of the old earth, and reducing the roots a little. Further shifting is attended to as the plant progresses, and it is watered liberally till the stems decay in autumn, when it must be kept dry through the winter.

Cuttings, prepared from those shoots which are not surmounted by blossoms, and which manifest no indications of flowering, root with facility in a gentle heat.

Cuphea is taken from *cuphos*, curved, the capsule having a curved outline.



Tropæolum Moritzianum.

TROPÆOLUM MORITZIANUM.

(MORITZ'S INDIAN CRESS.)

CLASS. | ORDER.
OCTANDRIA. | MONOGYNIA.

NATURAL ORDER.
TROPÆOLACEÆ.

Generic Character.—*Calyx* five-parted; upper lobe spurred. *Petals* five, unequal; three lower ones smaller and evanescent. *Stamens* eight, free from each other at the base. *Carpels* three, suberose, kidney-shaped, indehiscent, furrowed, roundish. *Seeds* large, without albumen, attached to the cell, and conforming to it in shape. *Embryo* large. *Cotyledons* two, straight and thick.

Specific Character.—*Plant* an herbaceous perennial. *Stems* climbing. *Leaves* peltate, inclining to a roundish figure, smooth, with seven or nine lobes. *Petals* with coloured veins, nearly equal in length to the segments of the calyx; two inferior ones cuneate, fimbriated at the top, three superior ones spatulate, fimbriated above, with the claw much ciliated.

If this new and scarce species of *Tropæolum* produced an equal number of flowers to *T. tricolorum*, which is on all hands admitted to be the best of the genus, it would be a prettier and more desirable plant than that chief of herbaceous climbers, on account of its finer foliage, more luxuriant habitude, and the delicate fimbriation of its larger, more expansive, and quite as showy-coloured blossoms. These characteristics, indeed, will render it a superlatively excellent plant for the general cultivator; and its blooming in the autumnal season would yet more enhance its value, in consequence of the lack of good greenhouse flowers at that period, should it prove, by longer experience of its habit, to be a profuse-flowering species.

That this latter will ultimately be the case, we consider more than probable; for the specimens that we have hitherto seen have been but small, and placed in a variety of circumstances which may not have been congenial. In its aspect, it seems most related to *T. tuberosum*, and the larger-leaved species. Its foliage is of the peltate shape common to some other kinds, but less rank and coarse, and, having a neat yellow protuberance at the extremity of each of its principal veins, which increase in size with the growth of the leaf, is quite an interesting object.

The stems climb, and the petioles clasp whatever is placed for their support, in the usual way, and the flowers stand out on long peduncles in the same manner as those of *T. tuberosum.*

We are told in the Botanical Magazine, that the seeds of this plant were presented by Mr. Lockhart, of Trinidad, to Mr. Murray, of the Glasgow Botanic Garden, having been collected in Cumana. The plants flowered at Glasgow, for the first time, in July 1840. Messrs. Young, of Epsom, obtained the species from that establishment last season, and flowered it in July and August of the current year. Our artist took the annexed figure at that time. It blooms from the axils of all the leaves, and a strong specimen would doubtless present a rich mass of verdure and flowers from the period just mentioned till the arrival of winter.

It is stated in the work above quoted, that the plants placed in the open ground at Glasgow grew more vigorously, but evinced no disposition to flower; from which we infer that it is like *T. tuberosum*, which, it is well known, does not bloom freely in a pot, but becomes covered with blossoms in the open air, during favourable seasons. At any rate, it is highly advisable to try this experiment in the neighbourhood of London.

Whether in an exposed border or a pot, it will not bear to be trained formally, and the proper way to support it is to place a bushy stick, on which there are numerous small branches, in the earth near its roots, and let it scramble over this in whatever direction it may take. With regard to soil, any loamy earth will be found suitable. The roots of the out-door specimens should be taken up in the autumn, and preserved from frost and damp through the winter, to be managed as common Dahlias in the spring; that is, plunged in rough pots, and set in a frame till the weather admits of their being transplanted. It is propagated with the greatest ease by cuttings.

Tropaion, a buckler, is the word from which the generic name is derived; the leaves being supposed to resemble a buckler.

OF GARDENING AS A SCIENCE.

NO. IX.

AIR.

The air of the atmosphere must be considered as at least important to vegetables, although it does not appear so vital to them as it is to the animal organization; for, in point of fact, its direct operation cannot be decidedly traced. The composition, however, of the air must be understood, in order that the physiologist may be prepared to investigate its agency. Chemists are in the habit of stating that one hundred volumes of air consist of twenty-one volumes of oxygen gas, and seventy-nine volumes of nitrogen gas—in a condition of simple mixture, not of chemical union—they therefore assert that "the composition of the atmosphere is extremely uniform in all parts of the world, and at all heights above its surface." But when they assert this, they admit and afford proof that air contains at all times varying proportions of aqueous vapour and of carbonic acid; and therefore as an approximation we find that "the ordinary constituents of the atmosphere appear to be the following:—

Nitrogen	by measure	77·5	or by weight	75·55
Oxygen	,,	21·	,,	23·32
Aqueous vapour . .	,,	1·42	,,	1·03
Carbonic acid . . .	,,	0·08	,,	·10
		100		100

Brande's Manual, p. 411."

Let us now recur to Liebig (pp. 16, 17) in order to acquire insight into some remarkable phenomena, which, were they not of familiar occurrence, are of magnitude sufficient to overwhelm the mind with awe.

Presuming that one hundred volumes of air contain twenty-one volumes of oxygen, he observes, "Although the absolute quantity of oxygen contained in the atmosphere appears very great when represented by numbers, yet it is not inexhaustible. One man consumes by respiration about forty-five Hessian cubic feet (nearly twenty-five English) of oxygen in twenty-four hours; and a small town like Giessen, with about 7000 inhabitants, extracts yearly from the air, by the wood employed as fuel, more than 1000 millions of cubic feet of this gas." In a note, we find "The air contains in maximo $\frac{66}{1000000}$ carbonic acid gas, and $\frac{21000}{100000}$ oxygen gas. A man consumes in one year 166,075 cubic feet of oxygen, or forty-five cubic inches in one day, according to *Lavoisier*, Seguin, and Davy; a thousand million men must accordingly consume 166 billion cubic feet in one year; this is equal to $\frac{1}{1000}$th of the quantity which is contained in the air in the form of carbonic acid. The carbonic acid in the air would thus be doubled in 1000 years, and man alone would exhaust all the oxygen and convert it into carbonic acid in three hundred and three times as many years. The consumption by animals, and by the process of combustion, is not introduced into the calculation."

Every act of respiration, of combustion, and of fermentation, develops carbonic acid, which passes into, and blends with the atmospheric volume; but we must postpone the consideration of this gas for the present; it is too important to be slurred over.

The theory above alluded to, that the atmospheric gases exist in the state of *simple mixture*—not in that of chemical union, is strengthened, 1st, by the following experiment by Dr. (then Mr.) Dalton :—Two jars of different kinds of gas being placed one above another, but properly connected together, the upper vessel containing the lighter of the two airs; a portion of this lighter air descended through the heavier air, while a part of the latter ascended to, and through the lighter one, till an entire and uniform mixture was produced." Upon this great fact among others is founded the hypothesis that every gas is a vacuum to any other gas, lighter or more ponderous.

2nd, By the comparative gravities of the gases, alone, and in a state of mixture. Nitrogen is lighter than atmospheric air, and still lighter than oxygen gas; for one hundred cubic inches of nitrogen are estimated (under a mean pressure and temperature) at 30·16 grains. Whereas the same volume of oxygen weighs 34·60 grains. But if the two be blended together in the proportion of seventy-eight or seventy-nine parts of the former and twenty-one parts of the latter (or in round numbers about four and one), a mixture will be produced which, as respects weight and chemical properties, corresponds with those of the atmosphere, making allowance for the carbonic acid and aqueous vapour which are always existent in the latter; thus the weight of one hundred cubic inches of the two is found to be very nearly 31·011 grains.

3rd, By the chemical axiom that "whenever two gases or liquids unite *chemically* the compound has greater density than the mean density, thus the vapour of water, at the heat of boiling, occupies much less space than the hydrogen gas and oxygen gas which compose it would have occupied at the same temperature."

With reason, therefore, it is concluded, that atmospheric air is not a chemical compound in the ordinary acceptation of the term; and it now remains to inquire, what is the agency which it exerts upon the vegetable creation? In order, however, to afford scope for mature reflection, it will not be irrelevant to refer to an article which appeared in the *Gardener's Magazine* of 1834, Vol. X. page 207, "*On growing Ferns and other plants in glass cases* in the midst of the smoke of London," by *Mr. Ward*, Surgeon. Before we cite the precise description of the cases by the author himself, it is proper to mention that, on the 2d of September of the present year, after a lapse of 7½ years, we inspected the collection, which now consists, not only of glass cases, in windows facing the south, the enclosed atmosphere of which is sometimes raised by solar heat to 100°, but of a close sort of fossil greenhouse at the back of the house, glazed with puttied laps, which resembles a kind of damp grotto. The external surface of the lights is quite disfigured with the soot which abounds in the impure atmosphere of Wellclose-square: yet in this gloomy and extremely damp erection, Ferns of all climates flourish in verdant health; and not ferns only, but *Thunbergia*, *Begonia*, *Fuchsias*, and other plants, which are the ornaments of our stoves and greenhouses. In the glass cases no air can enter but what passes through the mould; and yet, if our memory deceive us not, some Orchidaceæ and tropical plants thrive and even blossom, although neither air has been admitted for seven years, nor any water given for more than five months. We will now refer to the article in question.

"I was accidentally led, about four or five years ago, to make some experiments on the growth of ferns, &c. in closely-glazed vessels, from the following circumstance:—I had buried the chrysalis of a Sphinx in some moist mould in a large bottle, covered with a lid. The insect attained its perfect form in about a month, when I observed one or two minute specks of vegetation upon the surface of the mould. Curious to observe the development of plants in so confined a situation, I placed the bottle outside one of my windows with a northern aspect: the plants proved to be one of *Poa annua*, and one of *Nephrodium* (*Asplenium*, Swz.) *filix mas*. In this situation they lived for more than three years, during which time no fresh water was given to them, nor was the lid removed. The fern produced four or five new fronds every year; and the Poa flowered in the second year, but did not ripen its seeds. Both plants ultimately perished from the admission of rain-water, in consequence of the rusting of the lid. I have repeated this experiment with uniform success upon more than sixty species of fern," (these are enumerated,) "and also several other plants which delight in moisture, as *Oxalis acetosella*, *Anemone nemorosa*, *Dentaria bulbifera*, &c. &c.

"The ferns, &c. may be placed in boxes of any size or shape, furnished with glazed sides and a glazed lid. The bottom of the box should be filled with nearly equal portions of bog-moss, vegetable mould, and sand; and the ferns, after planting, should be most copiously watered, and the superfluous water allowed to drain off through a plug-hole in the bottom of the box: the plug is then to be put in tight, the glazed lid applied, and no farther care is requisite than that of keeping the box in the light. In this way plants will grow for years without any fresh supply of water. The numerous experiments I have already made have, I think, established one important fact—that the air of London, when freed from adventitious matter, is as fitted to support vegetable life as the air of the country.—N. B. Ward. March 1834."

We may now safely inquire, of what use is air to vegetation? and from comparison of facts, are inclined to indulge the converse of the received opinion, and to presume, that plants are the instrument adapted by nature to the purification of air.

Air, that is, the mixture of oxygen and nitrogen, doubtless promotes the prolificacy and maturation of plants: it checks luxuriant growth, favours the development of the floral organs, promotes evaporation, and carries off moisture with rapidity; but if we seek in it the supply of nutrimental matter, we shall possibly be disappointed. It is to the carbonic acid, and the aqueous vapour held in solution, that we must refer: the first acts directly upon the foliage; the second acts indirectly, in the form of rain, or dewy moisture—agencies which do not form any part of the subject now under investigation. Whatever tends to decompose air by the abstraction of oxygen, deteriorates it, as we have seen; but is there any reason to suppose that plants decompose air? If they do not, then air is to be considered as a vehicle or medium only calculated to receive and transmit gaseous matters.

In this view of the subject, we are assisted by the evidence furnished by the experiments of Mr. Ward. Air so impure as is that of the immediate vicinity of Wellclose-square is deadly to vegetation; but the portion which permeates through the soil of his cases, or the almost sealed glazing of his subterranean *fernery*, is purified by filtration, and the plants are verdant as in their own rural habitats. Do not these facts teach us, that we are too liberal in our applications of air; and would not the major part of our tender plants thrive equally well with closed glasses, and even with puttied laps? Moisture would be more regularly maintained and distributed; the most brilliant light would be better supported, and vegetation be consequently rendered more luxuriant. We have seen a fig-tree in full foliage, removed from a stove to the open air, which, within twelve hours after its removal, had not a single leaf alive.

Air checks, but does not harden; it ripens the wood, and therefore promotes bloom: hence its great use to geraniums, heaths, and many hard-wooded tribes. But it is inimical to luxuriant growth, and therefore should not be permitted to enter any house in the form of a current, especially as it is a known fact, that plants support a much higher and lower temperature in close situations without injury. Let experiments be widely instituted in order to ascertain the agency of air; for, after what we have witnessed, it becomes a question whether, as a general thing, we are not at infinite pains to ventilate our houses, with no other result than the incurring much trouble without any corresponding advantage.

CULTURE OF IPOMŒA LEARII.

It is a singular fact, and one which reflects high credit on the floriculturists of this country, as well as proves, to a demonstration, the comparative perfection to which the art has been brought, that, notwithstanding the ungenial nature of our climate, and the many difficulties which the grower of exotic plants must necessarily have to encounter in consequence thereof, multitudes of species attain a finer and more splendid condition under the treatment here afforded, than in their native state.

Out of many plants that might be adduced in support of this statement, we select one that will best serve our present purpose, as it will give occasion for a few hints on its culture. This is *Ipomœa Learii*. In Ceylon, where it was found wild in abundance by Mr. Lear, a collector to Mr. Knight, of the King's Road, Chelsea, the flowers are so diminutive compared with those developed in such amazing quantities in the stove of Mr. Knight, that the latter were scarcely recognised as identical with the former; and its extraordinary luxuriance beneath artificial management is never realized in its ordinary localities.

The extremely ornamental nature of this plant,—a good specimen producing several hundred flowers daily,—renders any account of its cultivation peculiarly interesting, and we proceed to detail the leading points in its character, habits, and treatment, which we have observed in the various places where plants have been open to our observation from the period when it was first introduced. *I. rubro-cœrulea*, though a very beautiful species, is, we may state, so completely eclipsed by its more novel and showy ally now before us, that, except in larger collections, it has already passed out of notice.

No one can have had the opportunity of frequently examining *I. Learii* without perceiving that it is a most rapid-growing plant, covering an immense surface, and ramifying into an astonishing number of strong healthy branches. Those who have seen the original specimen, however, at Mr. Knight's, and some others that have been obtained from it, must farther have detected two kinds of branches, one sort ascending, and attaching themselves to whatever is placed for their support, the other issuing from the base of the stem, and trailing along the ground like the runners of strawberries, but not protruding shoots from their joints. The difference between these two descriptions of branches is much the same, in effect, as that between common shoots and suckers in ordinary shrubs and trees; and much importance may be ascribed to the use that is made of them. If, from a wish to avoid cutting the specimen, the lower trailing shoots are employed for propagation, the plants formed from them will be very like those produced by the suckers just named;—healthy, vigorous, and disposed to occupy a large space without blooming. Cuttings of the upper shoots, on the contrary, produce flowering laterals in a very short time, and a fine blooming specimen may even be raised in one season, by taking off the extremities of the longest shoots as cuttings. Indeed, the dimensions and early blossoming of the plant may be regulated most easily by the distance at which the cutting is taken from the main stem, provided it is from one of the principal branches. If prepared from the extremity, it will flower very speedily, and in a dwarf condition. If made from a shoot that is in an early stage of its growth, it will constitute a larger specimen, and be longer in bearing flowers; while the intermediate conditions may readily be realized by a due regard to these simple circumstances.

By bearing the foregoing facts in mind, the cultivator will be enabled to obtain plants of different sizes and in a variety of states, according to the object he wishes to accomplish with them; from shading a roof fifty feet long, to covering a wire trellis affixed to a pot. And we have repeatedly witnessed the fulfilment of both these ends by the adoption of the means herein described.

Being such an exuberant-growing plant, and occasioning a dense shade, it is admirably fitted for training beneath the roof of an orchidaceous or propagation house. Unlike *I. rubro-cœrulea*, which is apt to die after the first year, it is a thoroughly shrubby species; hence it may be planted in a bed or border for a permanent purpose, and as it loses its leaves in winter, and will then bear pruning back to any extent, it is still better adapted for shading a house, since no such aid is desirable through the winter. When thus pruned, it will begin growing again very early in the season, and in a few weeks cover the space it had before occupied, flowering in inconceivable profusion from May till the end of autumn.

Where this plant is trained to the roof of a house as a shade, and where it is merely fastened beneath the rafters in the general way, it should always be supported by wires running parallel to the direction in which it grows, and not by tying or nailing it up according to the usual practice. Its *twining* habit renders it preferable that it should have something round which the branches can coil; and stout wire or slender iron rods afford this desideratum.

In such situations as those last referred to, it will continually be found that nearly all those short lateral shoots on which the flowers are borne, incline upwards towards the glass, against which they will soon press and become injured if not carefully watched. To allow them to take that position would also have the effect of permitting them to escape observation, for they could not thus be viewed from the interior of the house; so that it is necessary to draw these shoots gently into a contrary direction while they are young and tender, and if the plant has had its branches trained closely enough together, the flowers will not again rise through them. Moreover, when the blossoms commence expanding, they require to be screened from the more powerful rays of the sun. Opening in the morning, they will change colour and fade long before midday if exposed to the solar rays; but where they are brought below the foliage, the latter is commonly sufficient to protect them. We may add, while speaking of the usefulness of having a density of leaves, that another advantage attends close training; inasmuch as, though when embracing single chains or wires hung in festoons about the different parts of the house, or along the sides of its walks, the appearaace is very elegant and attractive, a far more gorgeous display is created by a broad and continuous mass, such as would result from the entire investment of any large surface.

It has been said in the commencement of this paper that our subject is much superior in England, in all its characters, to what it is in Ceylon; and we may now glance at the chief cause of this superiority, convinced that whatever it may be, it is of the greatest moment that the culturist should be apprised of it, in order to repress effectually any disposition it may evince to relapse into its wonted inferiority. We attribute its improvement mainly, then, to the more genial atmosphere and nutritive soil with which it has been favoured since it was received into Britain.

The plants at Mr. Knight's, which are unsurpassed by any that we have met with, have been kept in a house of a rather high continuous temperature, and are partially shaded by their position. The atmosphere, likewise, has ever been more or less moist; and the soil is loam, enriched with decayed manure, or leaf-soil, or some similarly nutritive material. Now, it may be presumed, that in its native districts the plant grows at the foot of, or among, trees and shrubs, which deprive it of much nourishment; that it is alternately exposed to the glare of the sun and a dry atmosphere, or too much shaded and confined by the larger plants which grow above it; and that the variations of temperature from extreme heat to at least some degree of cold to which it is liable, however well they may harmonize with the economy of its existence, are not likely to promote the full, constant, and rich development it here attains. To maintain this last standard, therefore, it is evident to us that the conditions which combined to cause it must be preserved in full operation; and, in addition, that the roots should be allowed to range through a tolerably spacious bed of soil, which is not too deep, and has an air-chamber, or a perfect system of drainage beneath it. With those specimens that are grown in pots, the same principle may be kept in view, though it cannot be carried out to a like extent; for, by often shifting, the plant can finally be transferred to a very large pot, and afterwards the roots may be pruned, and new soil added whenever it seems inclined to degenerate.

Perhaps, when we mention the pleasing fact that *I. Learii* has proved capable of succeeding in a greenhouse, it may be thought that what we have said concerning the utility of heat and a moist atmosphere is wholly controverted. But, while we recommend strongly (particularly to those who have no stove, or only a small one, or cannot spare enough room therein) the employment of this species as a greenhouse climber, we must declare that its habit is not so vigorous nor its leaves and flowers so fine as when grown in a stove. The degeneration is certainly very trifling, and unquestionably will not support a shadow of an objection to the plan itself. At Messrs. Henderson's, of Pine-apple Place, there is, in fact, a specimen in the greenhouse, which, for the size and beauty of its flowers, could scarcely be excelled; still it must be remembered that this has been raised from a plant kept in the stove, and has not yet been wintered in a greenhouse.

At other places, we have noted plants of this species blooming in the greenhouse, and actually in the open air during summer; but we are constrained to remark, that the greater the vicissitudes of temperature, and the greater the degree of atmospheric change to which it has been exposed, our observation warrants the assertion that it invariably loses its splendour to a proportionate extent.

The mode we would suggest for ornamenting the greenhouse with two or three specimens of this superb *Ipomœa*, would be the following:—Let cuttings be taken from the points of some of the principal shoots of plants that are maintained in a stove, a few weeks before those shoots arrive at a flowering age, and let these be struck in a slight hotbed. After they are potted, they can be retained in a moderate temperature till they have grown a little, when the top of the plant should be cut off, to induce it to branch. They can be repotted, if requisite, at any period; and when the branches are a foot or more in length, let the plant be shifted into a large pot, trained round a suitable wire trellis, and removed shortly afterwards to the greenhouse, where it will flower finely in the summer and autumn, and may be thrown away in winter. It is worth while, nevertheless, to try how the species will thrive after being housed for the winter in a greenhouse.

By the same plan, rather more rapidly pursued in respect to the inuring of the plant to a lower temperature, a limited quantity of specimens could be prepared for planting against a conservative wall about the end of May, and they would make a brilliant show during one or two of the autumnal months. They might be left to perish on the advance of winter.

The length to which this dissertation on a single plant has been pursued, would demand some justification beyond the notoriously magnificent character of that species, were not the directions given and the hints offered for the most part quite as applicable to a great number of handsome climbers, comprised in the same group, and in other genera.

REMARKS ON FORCING ROSES AND OTHER PLANTS.

If it be true that any practical information is of double value when imparted just at the time there is an actual demand for it, we may hope that the advantage derivable from the seasonableness of this paper will more than counterbalance whatever defects may be apparent in its contents. October being the month in which roses are usually placed in the forcing frames, and other plants either similarly treated or prepared for the like stimulation, the directions we are about to supply may not be out of place.

In every garden where proper facilities are procurable, nothing affords a more decided source of enjoyment than the possession of a few flowers, both as specimens on the plant and for making bouquets, at that period of the year when external nature is chilling, dreary, and disconsolate. There are not many, however, who succeed in flowering roses well at this season, and still fewer who manage to have a general collection of forced flowers throughout the severer months, without incurring considerable trouble and expense. In this view of the case, therefore, we have another reason for bringing forward the simple statements which follow.

The point wherein cultivators are most palpably wrong, is the practice of forcing plants in a stove or any common house of the ordinary size, heated solely by either flues or hot water, and seldom sufficiently moist for plants that are required to grow vigorously. We consequently begin by affirming that the most appropriate places in which to carry on such a process are small pots and frames, where the atmosphere and temperature can be easily and economically kept at any requisite degree of heat or moisture. Such receptacles are further suitable because they can be situated conveniently in a frame-ground, or concealed part of the garden, where the whole process may be carried on to its completion without anything but its results ever being open to inspection.

Another evil generally arises from the mode of furnishing the artificial heat necessary. If flues or hot water are used, the atmosphere is nearly always too arid, and drought is one of the most unfavourable agents which can act on growing plants. The only congenial system, and that which is infinitely less expensive, is to heat the pit or frame by having a bed of bark or newly-gathered leaves in its centre, and supply whatever additional temperature is required, from coatings of stable-manure placed round the outside. To render the latter effectual, the walls of the pit should be built with a considerable number of apertures in them, and it will be better if there is a chamber beneath its centre, in order that the heat from the outside may be more freely communicated.

Two of the most useful aids gained by this plan of heating, will be the constant moisture which it will preserve in the atmosphere, and the facility it will give for plunging the pots containing the plants to be forced in a fermenting substance, which will act directly upon their roots. Of the importance of the former, the culturist who has the slightest knowledge of vegetable wants must be fully aware; and in no other way could it be so readily and effectually obtained. The beneficial action of heat on the roots of plants is not so universally understood, and may bear a little elucidation.

All are more or less cognizant of the fact that bottom-heat is of great service to most plants that demand a high temperature; and while, without question, its operation may be traced to the genial evaporation it occasions, as before noted, some of its good effects are as positively due to the impulse it gives to the roots actively to perform their functions. However much the leaves of plants may assist in absorbing that nourishment which is essential to their support, they can only be regarded as auxiliaries to the roots, these last being the main agenst through which food is derived. Hence, if their capacity of imbibing alimentary matter does not increase in the same ratio as that of the upper portions in disposing of it,—and the immediate and equable action of heat on both can alone produce this conformity,—it must inevitably happen that the stems, leaves, and flowers become impoverished and attenuated. The utility of bottom-heat, then, is in causing the roots to ramify, and extend their means of acquiring sustenance, in exact or even increased proportion to the new demands made on them by the branches. And with forced plants, whose condition is so thoroughly artificial that they are more liable to be affected by adverse circumstances, the necessity of balancing their powers of absorption and appropriation is additionally stringent.

With adequate attention to the replenishment of the outer coatings of manure, and the use of a thick covering to the glass in very severe weather, a heating apparatus may be wholly dispensed with, particularly if the height of the pit is not greater than two or three feet, in which case there will be a less radiating surface. A low pit will also be advantageous, from the necessity it will entail of keeping the plants near the glass, a subject we have yet to enforce.

The diminished degree of solar light naturally experienced in the winter months, renders it imperative that growing plants should receive as much as possible of its influence ; and to secure this they must be placed within a foot of the roof, and at a sufficient distance from each other to admit the rays of the sun all round them. At a place with which we are familiar, where they excel in forcing roses, the angle at which the roof is constructed is on a very much steeper inclination than that of plant-houses generally ; and we think this a very judicious plan, where it can be adopted.

For the sake of convenience, where expense is not so much an object, it must be admitted that a low pit, with a small hot-water apparatus capable of being applied in cases of necessity, and having a central raised bed, around or in the front of which the attendant can walk, is preferable to one which cannot be entered ; as the plants could thus be watered and tended without exposing them to the cold air. But for small gardens such an outlay is needless.

We must now briefly detail the treatment of roses by a friend whose success in forcing them has often elicited our admiration. And in so doing, we shall confine ourselves, as nearly as practicable, to his own words. There is a popular prejudice to the effect that plants will not endure forcing for several successive years, and that they become enfeebled by being excited annually into a premature development. But the culturist must have been guilty of gross mismanagement whenever roses exhibit such a result; for, on the contrary, by continual forcing they acquire a habit of early expansion, and really grow more healthily in consequence.

Assuming that the plants have been procured from the flower-borders or nursery, and forced for one season, they are taken from the house towards the end of April, and potted in a mixture of loam and decayed manure, using an abundance of the latter. Previously to potting, they are pruned, and each of the shoots is cut back to about three eyes. In potting, pains are taken to press the ball of roots into a small compass, so as just to admit of a little earth being placed round it in the pot ; since it is essential that the pot should be as full of roots as possible, in order, while it is in the forcing-house, to prevent water from stagnating, and the roots from cankering. The pots chosen are the size known as 32, or those in which there is that number to a cast, but larger ones are desirable where the plants are old and have reached a greater size.

After potting, the plants are plunged to the rims in beds in the kitchen garden or reserve ground, and a mulching of rotten manure is placed over the beds, to the depth of three inches. Should the summer be dry, they are occasionally watered in the evening of the day.

From this situation, a quantity of plants are taken, about three weeks before it is intended to begin forcing them, and put in a cold frame or pit, from whence they are removed in lots of six or twelve, every week or fortnight, to the forcing-house, and their places supplied by others from the beds. For early forcing, six weeks or two months are considered requisite to bring them to perfection; but to have flowers at the end of February, or the beginning of March, (at which time they will unquestionably be far finer than at any former period,) a month's forcing will suffice. At first, they are only subjected to a moderate temperature, which is gradually raised to 60° or 70° in the day.

As soon as the shoots are developed, those bearing flower-buds should be at once supported by stakes, as this brings them nearer to the light, saves them from injury, and gives the plants a neat appearance, which could not be realized unless by the timely performance of such an operation. If not narrowly examined, a kind of grub will destroy all the buds. It must be picked off by the hand, and demands considerable patience and vigilance. Should the green aphis appear, it can at once be killed by tobacco-smoke. The plants should be syringed freely each day, when the weather is such that their leaves can speedily be dried; but syringing must be relinquished in dull damp weather.

Thus tended, the flowers will open almost as finely as those grown in the open air, and as the plants get older and habituated to such treatment, their beauty will be augmented. Care should be taken to ripen their wood properly in a moderate temperature before exposing them to the external air, and for this purpose the light of the sun will be invaluable.

In late forcing, a tolerably good plan is to surround a bed of moss roses or other fine sorts with a slight brick skeleton frame, or one which has a brick omitted at trifling intervals, and cover this with lights in February or March, surrounding it with heating manure. We have seen excellent roses produced in this way for many successive seasons; and when they have ceased flowering, the lights are removed, the manure taken away, and they are left flourishing in the same conditions which they enjoy in the open border.

FLORICULTURAL NOTICES.

NEW OR RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR SEPTEMBER.

Abùtilon bedfordiànum. Called *Sida Bedfordiana*, but evidently belonging to the genus *Abutilon*, which is a division from *Sida*. The species forms a small tree, growing about fifteen feet in height, and bearing large, smooth, cordate, toothed, seven-nerved leaves. The flowers appear on long erect peduncles; in this respect, and in the shape of the reflexed calyx, differing from those of *A. striatum*, which they much resemble in colour and markings. It was found by Mr. Gardner, in the Organ Mountains of Brazil, towards the beginning of 1837, and sent, amongst others, to His Grace the late Duke of Bedford. Having flowered at Woburn Abbey in November 1840, Sir W. J. Hooker thinks it worthy "to bear the name of this illustrious family, and to commemorate thereby the services rendered to botanical science by the present possessors of Woburn, under whose auspices the collection of plants is maintained with undiminished splendour." It has probably been kept in a stove, but may, perchance, prove capable of thriving in a greenhouse. *Bot. Mag.* 3892.

Borònia triphýlla ; *var.* latifòlia. Lately figured in this Magazine under the name of *B. ledifolia*, which, Dr. Lindley says, is quite a distinct species. Messrs. Loddiges, from whom it was obtained, received and cultivated it with the latter title ; but it now seems to be a broad-leaved variety of *B. triphylla*, a species not yet, we believe, introduced to our collections. It is distinguished by its opposite trifoliate leaves. *Bot. Reg.* 47.

Bossiæa tenuicaùlis. A pretty, free-flowering species, conspicuous for the slenderness of its stems and branches. It "was raised at the Botanic Garden, Edinburgh, from Van Diemen's Land seeds, sent by Mr. Cooper, gardener at Wentworth House, in April 1836, and produced its rich and lively blossoms for the first time in the greenhouse, in March 1840." The stems are procumbent, the leaves nearly sessile, ovate, and mucronulate, and the flowers, which are deep yellow with a brown blotch at the base of the standard, and a brown keel, are borne on the upper part of the shoots. *Bot. Mag.* 3895.

Cliánthus cárneus. Better known in nurseries and gardens by the name of *Streblorhiza speciosa*, under which appellation it was originally described and introduced, but has since been determined a *Clianthus*. It is spoken of as a climbing species, with handsome evergreen pinnate leaves, and upright racemes of pale pink or deep flesh-coloured flowers. The last are neither so numerous nor so showy as those of *C. puniceus ;* yet the plant is considered "worth cultivation as a twiner." It flowers well in a cold conservatory, planted in a rather rich soil, with plenty of room to grow ; but is not adapted for cultivation in pots, as it requires to become large and have great freedom at its roots before it will bloom abundantly. Cuttings strike in the usual way, and the plant blossoms in the earlier months of the year. It is a native of Philip's Island, "a small rock off the coast of Norfolk Island." *Bot. Reg.* 57.

Dendròbium díscolor. Imported from Java by Messrs. Loddiges, and having long stout stems, which vary in thickness, and from near the summit of which the copious racemes of flowers are protruded. These produce "about sixteen dingy yellowish-brown flowers, as much curled and wavy as those of a *Gloriosa*. The lip has the same dull dirty colour, except along the middle, where it is decorated with five deep wavy plates of a light violet." It flowers in June and July, and continues blooming for a considerable period. *Bot. Reg.* 52.

Hypocalýptus obcordàtus. An old, but ornamental Cape plant, sometimes called *Crotalaria cordifolia.* It is a shrub, growing from one to two feet high, with angular branches, trifoliate leaves, the leaflets of which are obcordate, and terminal reddish purple flowers. Its blooming season is May and June. *Bot. Mag.* 3894.

Odontoglóssum pulchéllum. This charming white-blossomed epiphyte flowered in February last in the collection of J. Bateman, Esq., of Knypersly, and subsequently at Chatsworth. "The more striking features in it are the long, thin pseudo-bulbs, the very narrow grassy leaves, and the singular protuberance at the base of the white lip. This protuberance is deep yellow, spotted with crimson, very fleshy, firm, and shining, and is almost horseshoe-shaped in front, while it is distinctly three-lobed behind, in consequence of two deep depressions." It is recommended to keep it quite cool and dry at that season when it is not growing. *Bot. Reg.* 48.

Oxalis lasiándra. A Mexican species, thought to be from the high table land of that country. The leaves are all radical, having from seven to nine oblong-spatulate leaflets, which are quite hairy. The flower-scapes are twice as tall as the petioles, hairy, and bearing umbels of about twenty large handsome crimson blossoms. Dr. Graham observes—"We received it at the Royal Botanic Garden, Edinburgh, from the Garden at Berlin, in November 1840, under the name adopted. Mr. James M'Nab tells me it is there cultivated in the open ground, forming an edging to the walks. With us, it flowered in the greenhouse, and continued in beauty during many weeks. At Berlin, in the open air, it was not above nine inches high; with us it was more than twice as much." *Bot. Mag.* 3896.

NEW OR INTERESTING PLANTS WHICH HAVE RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Achimènes longiflòra. The term *Achimenes* has lately been applied generically to the old and delightful plant commonly known as *Trevirana coccinea*, and the present species is a new and exceedingly interesting addition from Guatemala, where it was found by Mr. Hartweg, and sent to the Horticultural Society, in whose gardens it has just bloomed. It has the same dwarfness of character, and seems to produce as great a profusion of flowers, as the favourite plant to which it is allied; but the blossoms are individually an inch or more in diameter, and of a pretty bluish-lilac tint. In both size and form they are equal to any *Petunia*, and the species will unquestionably be highly valued, and universally sought. Its cultivation is conducted in the same manner as that of the old *A. coccinea.*

Achimènes ròsea. Another beautiful acquisition from Mr. Hartweg, and collected in the same district. It is by no means so distinct as the former, however, and its great peculiarity is in the colour of the flowers, which are of a pale rosy-red, and perhaps a little larger than those of *A. coccinea.* The rich and brilliant scarlet hue of the blossoms of the latter will always render it superior to *A. rosea;* but this last will create a pleasing variety, and is decidedly novel. A plant which is apparently an additional new species of this genus is likewise blooming at the Horticultural Society's garden, and has large white flowers. These are, at present, less numerous than those of its congeners; but it will doubtless prove an ornamental stove plant.

Bœckia camphorósmæ. An elegant greenhouse shrub, introduced from the Swan River Colony, and flowered last month in the collection of Messrs. Henderson, Pine-Apple Place, as well as in that of other individuals. Its habit is somewhat like that of some Heaths, the leaves being short and dense, and the whole plant not more than nine inches or a foot high, with numbers of neat pinkish-white blossoms issuing from the sides of its curved and waving branches. From its general appearance it seems likely to prove an interesting and attractive species.

Bossiǽa paucifòlia. Tall, straggling, flattened branches, and diminutive brownish-yellow flowers, are the most conspicuous features of this new Swan River species, which has just bloomed with Messrs. Rollisson, of Tooting, and Mr. Low, of the Clapton nursery. It is a rather inelegant shrub, and is distinguished by the fewness of its leaves.

Catasètum citrìnum. Messrs. Loddiges have latterly blossomed this peculiar and novel plant, which has also been flowered by Mr. Edmonds, gardener to His Grace the Duke of Devonshire, at Chiswick. Unlike most of its tribe, it is remarkable for having flowers of a showy pale-yellow colour, and on this account is perhaps superior to many of its allies.

Cáttleya Aclándiæ. One of the finest species of this superlatively-handsome orchidaceous genus; but deriving its title to distinction not so much from the magnitude of its flowers, as from the richness of their colours, and the general dwarfness of the entire plant. Its stems are thin, not more than six or nine inches high, and bearing one, two, or several blossoms on their summit in the usual way. The flowers are about the size of those of *C. Loddigesii*, with the sepals and petals superbly mottled with brown on a greenish-yellow ground, and a deep pink labellum. A variety has recently bloomed at Messrs. Loddiges', Hackney, the sepals and petals of which are much paler than in the ordinary state, and have far fewer markings.

Cáttleya bícolor. A most beautiful as well as rare species, the stems of which are slender, not swelling in the middle, and from a foot to eighteen inches in height. The sepals and petals are mottled with pink and olive, and the lip is of a fine deep purplish-crimson, with the edges folding over each other, and inclosing the column. It is flowering in fine condition in Messrs. Loddiges' orchidaceous house.

Cáttleya citrìna. Among the rest of the Cattleyas, this species stands out very prominently from its small, roundish, whitened pseudo-bulbs, and narrow glaucous leaves. It may be recognised in the largest collection by these characteristics, and the flowers are produced from the base of the pseudo-bulbs on long pendent scapes, which sometimes bear one, and more rarely two, blossoms. They are of a lively citron colour, with a tinge of a paler-whitish tint in the lip; otherwise being large and showy. Messrs. Loddiges succeeded in causing it to bloom about two months ago, and it has since developed additional flowers in the same establishment.

HOULLÈTIA BROCKLEHURSTIÀNA. This new genus is a division from *Maxillaria*, to which it is closely related. The species here spoken of is a noble plant, with strong-furrowed, slightly-conical pseudo-bulbs, and large spreading leaves. The scape arises from beneath the younger pseudo-bulbs, and elevates ten, twelve, or an indefinite quantity of beautiful flowers, which are large, of a dull-yellowish ground, but very handsomely spotted and blotched all over with different shades of brown. It is flowering finely with Mr. Knight, of the King's Road, Chelsea.

OPERATIONS FOR OCTOBER.

As we stated last month, the period yet intervening between the present time and winter, must be one of active preparation where the perfect culture of plants is the object. Greenhouse species, that have not hitherto been transferred to their winter quarters, should be housed without further delay, and as this will render the re-arrangement of plants that have been retained in the house necessary, we may at once say that we consider a thorough examination of every kind of exotic of the utmost importance at this season of the year.

That this investigation may be justified, and conducted with a due regard to the purpose likely to be gained thereby, we shall advert to one or two particulars that ought especially to be attended to. First, it should be seen that the drainage of every pot is quite unobstructed. To judge of this, the mere observation of the state of the soil as regards dryness will be necessary. If it be unusually wet, and covered with moss, it will be advisable that the roots of the specimen should be exposed, and their state as to health or decay determined. In the case of their being found decaying, or inadequate to fill the pot containing them, the specimen must immediately be shifted into a smaller pot, just of sufficient size to hold its roots, removing the old soil, and substituting a fresh and porous earth. Again, the plants that have been out of doors may have the bottoms of their pots clogged with soil, or the aperture for drainage stopped, when a clearance should be at once effected. The pots of the latter ought, moreover, to be washed, the plants duly and neatly supported and trained, and the soil replenished on the surface where it has been washed away by rains. A pleasing appearance will not be the only good result of such tendance; for by a proper and permanent disposal of the branches, they will occupy less room, and not be so liable to overshadow or otherwise encumber the neighbouring plants.

The arrangement of plants in houses for the winter must be regulated greatly by the nature of the former. Hydrangeas, Fuchsias, and other deciduous shrubs that are inert during the colder months, may be placed in any dry cold position, even though light should be partly excluded, without receiving the slightest harm. It is indispensable, however, that they be kept just so cold as to prevent them alike from growing and from being injured by frost, and that they be put in a lighter and more airy position as soon as the leaf-buds begin to open.

For evergreen shrubs, such as Heaths and the majority of New Holland plants, a very different treatment is demanded. They must be so situated that the light and air can play around each, and never have their branches in contact with each other, or in any way shade or interfere with those nearest them. Where the extent of the collection will not admit of that arrangement, it will even prove much better to destroy a portion of the inferior sorts, and place the rest at a reasonable distance from each other; since beauty of specimens, not variety of sorts alone, should be the ultimate aim of the culturist. Plants intended for a temporary object, as, for example, supplying the flower borders in the following summer, must unavoidably be placed closer than the better greenhouse species; but the more the necessity of keeping them apart is perceived and acted upon, the more healthy will they remain, and the less liable will they be to perish by damp.

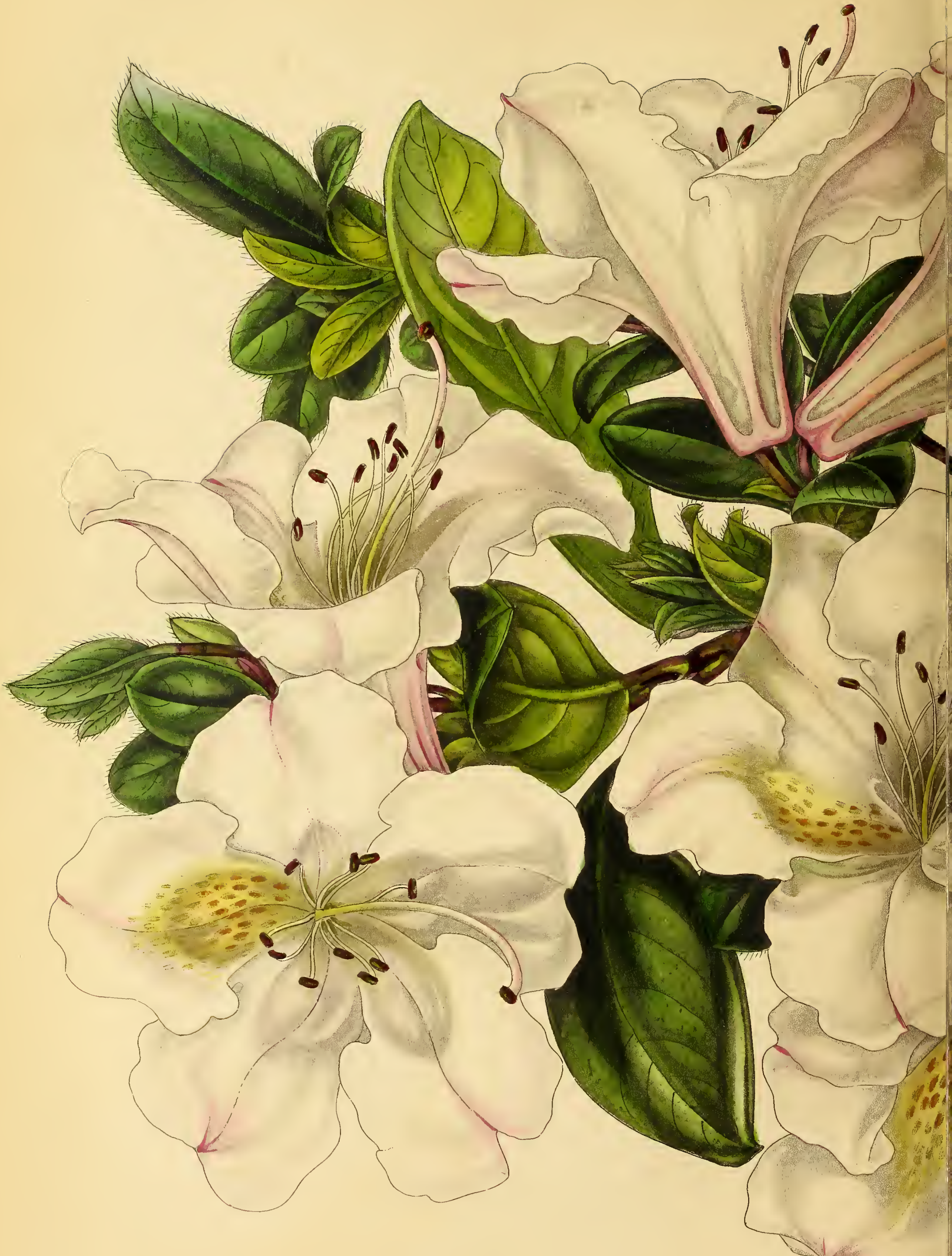
In the greenhouses, stoves of all kinds, and intermediate structures, the maturation of the wood of plants, and the promotion of a condition bordering on torpidity, should be diligently kept in view. To this end air may be largely admitted on all propitious occasions, and water is to be less and less liberally bestowed as the season declines. Syringing and shade may be now abandoned, and extraordinary developments be sedulously kept in check or removed by pruning.

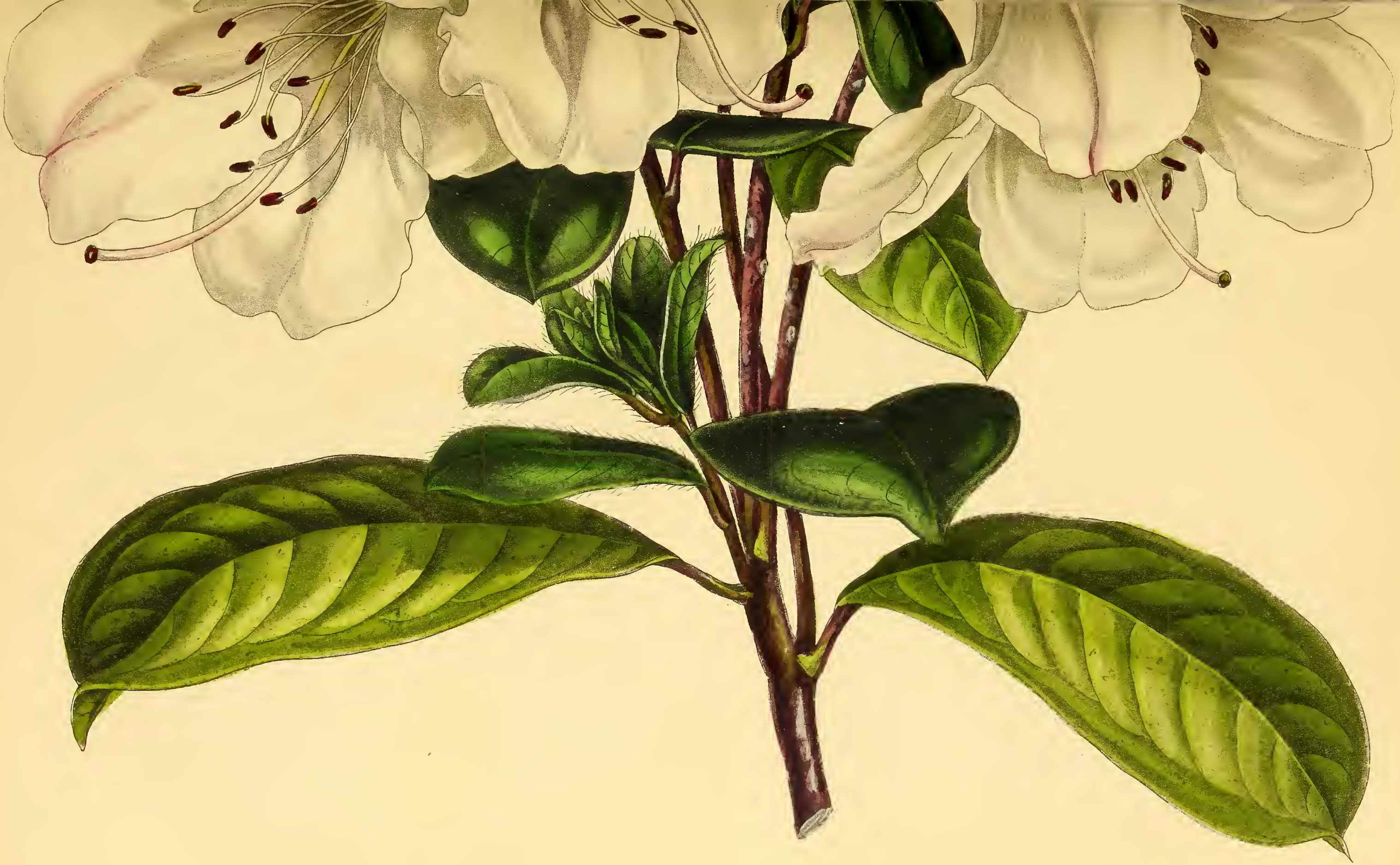
Evergreen trees and shrubs can be transplanted with safety about the end of the month, as, also, may most of those of a deciduous character. It is the easiest and best plan to transfer them while young; but they may be removed at almost any age if taken up with sufficient balls of earth attached to their roots, and the smaller rootlets preserved as much as possible from damage.

Tulips and other bulbs are sometimes planted towards the close of the month. The beds prepared for them ought to be frequently turned over prior to their being planted in them, and a small quantity of well-rotted manure may be appropriately added.

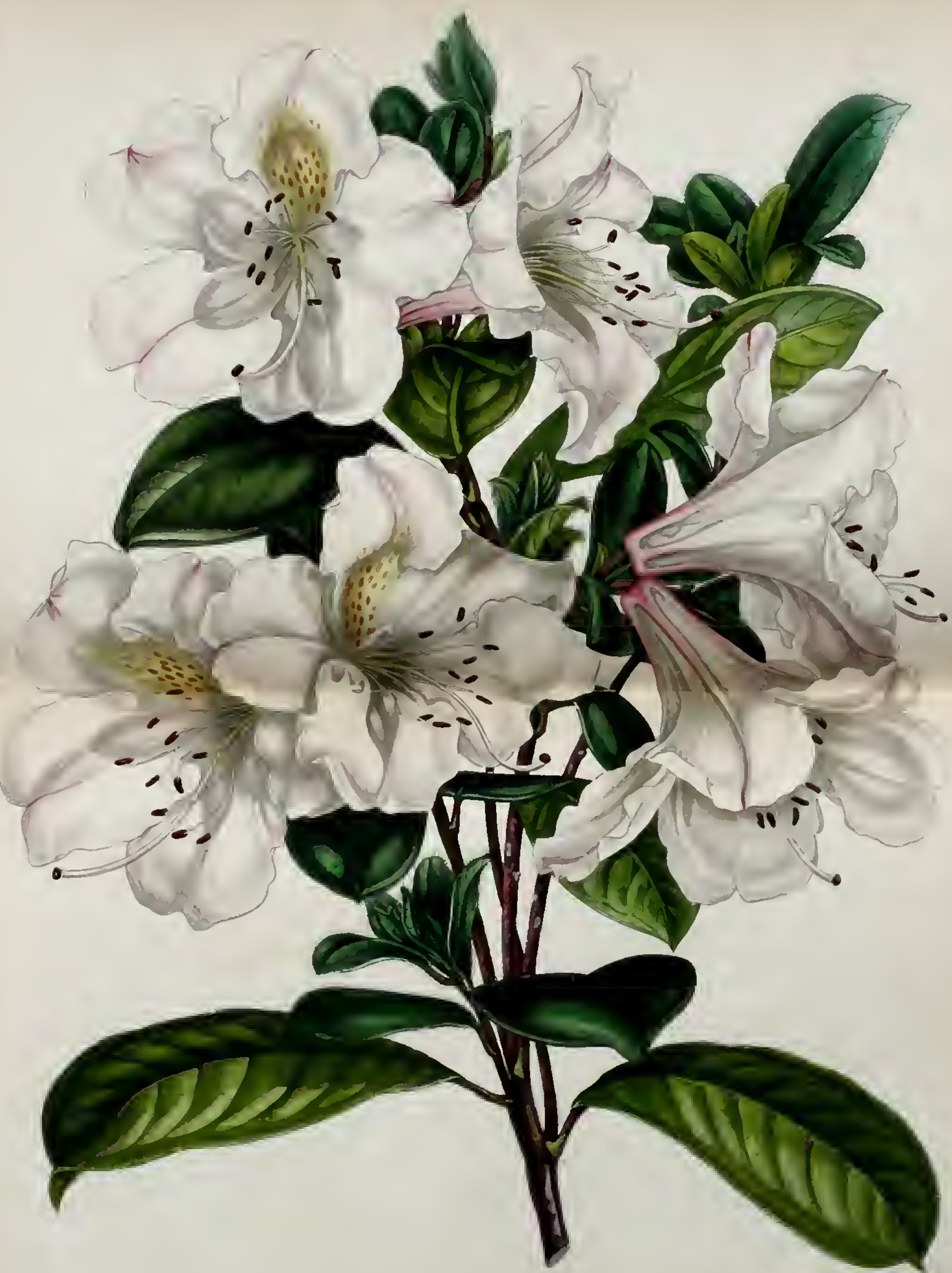
All tuberous-rooted or bulbous plants should be removed from the soil for a few months, in order to prevent them from growing in the winter, or from becoming saturated with moisture. They must be carefully dried before being stored, and placed where they will neither lose their vital functions by extreme drought or cold, nor have them excited by the contrary circumstances.

Forcing may be commenced, if flowers are desired by Christmas; annuals can be sown in pots for winter-flowering, and Mignonette in boxes for early spring; Roses may be layered; the pruning of deciduous hardy climbers can be begun; seeds should be carefully collected; and night frosts be guarded against wherever their influence would be dangerous.





Rhododendron Gibsonii



Rhododendron Gibsoni.

RHODODÉNDRON GIBSÒNII.

(MR. GIBSON'S ROSE BAY.)

CLASS.
DECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ERICÀCEÆ.

Generic Character.—*Calyx* five-parted. *Corolla* somewhat funnel-shaped or campanulate; rarely rotate or five-parted; limb five-cleft, somewhat bilabiate; upper lip the broadest, and usually spotted. *Stamens* five to ten, usually exserted, declinate; anthers opening by two terminal pores. *Capsule* five-celled, five-valved, rarely ten-celled and ten-valved, with a septicidal dehiscence at the apex. *Placentas* simple, angular. *Seeds* compressed, winged. *Don's Gard. and Botany.*

Specific Character.—*Plant* shrubby. *Stem* branching, and growing nearly erect, with bark of a rusty-brown colour, the outer coating of which peels off the old wood, and leaves a smooth ash-coloured bark beneath. *Petioles* ciliated on the edges, and covered with brown spots like the leaves and young wood. *Leaves* alternate, ovate-lanceolate, ending in a hard brown point, incurved, ciliated with long brownish deflexed hairs, punctate, rather silvery and free from hairs on the under side, slightly hairy and mottled with raised brown spots above; young leaves tinged with purple, particularly on the margin. *Flowers* large, whitish, tinted with pink, and spotted with yellowish brown on the lower part of the top segment.

Plants of this extremely beautiful species were introduced in 1837 to the gardens of his Grace the Duke of Devonshire, at Chatsworth, by Mr. J. Gibson, who found it on the summit of the Khoseea Hills, in the East Indies, at an elevation of upwards of four thousand feet above the sea. Being a plant of unquestionable merit, we have selected it to commemorate the services of the individual by whom it was collected.

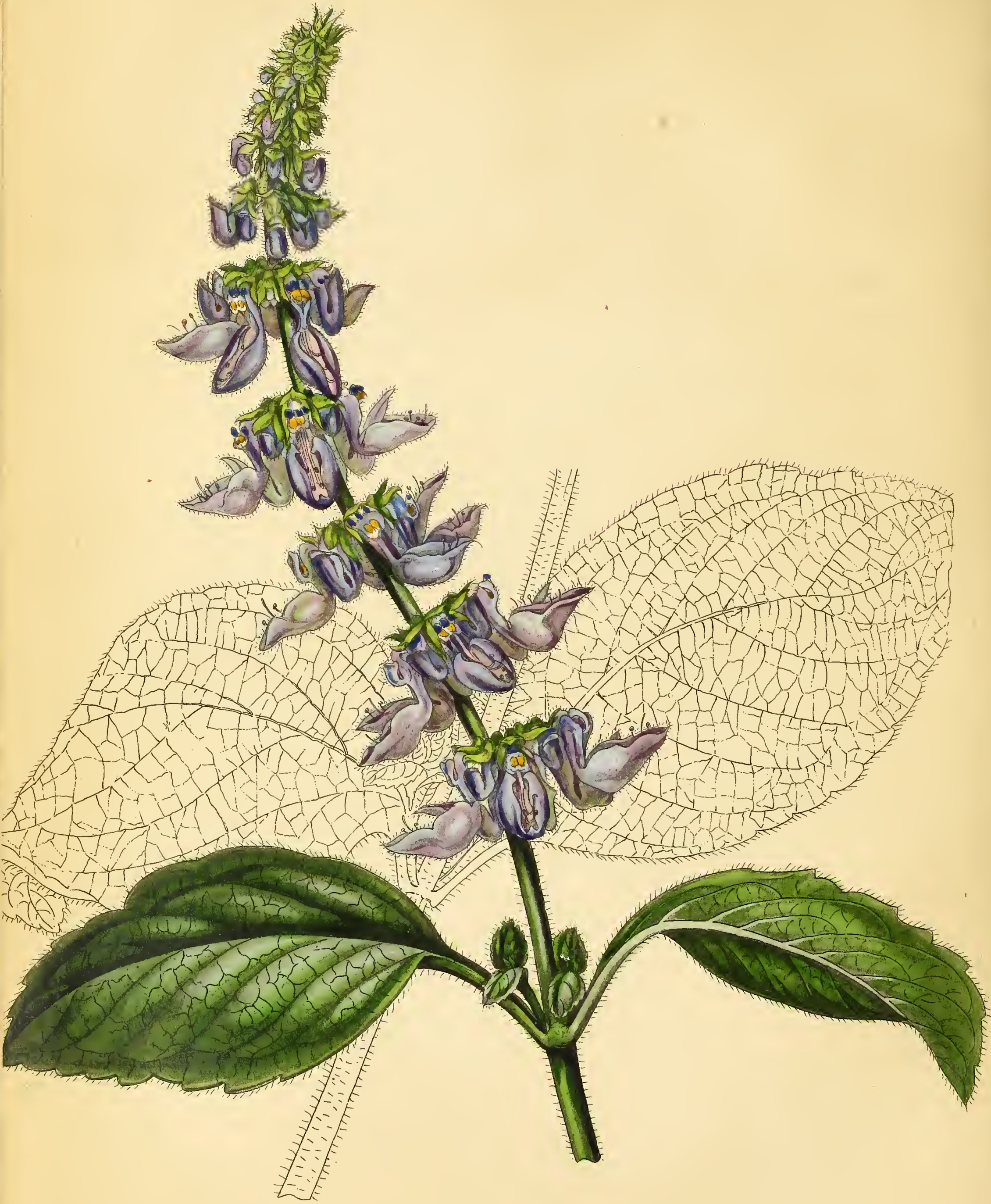
It has been so well depicted by our artist in the annexed drawing, that any remarks on its beauty are rendered unnecessary. What, however, gives it a very high claim to distinction, is the peculiar fragrance of its blossoms during the whole of the time they are expanded, and the very agreeable nature of this odour. In this respect it is a most valuable addition to the genus, and will furnish an admirable opportunity for improving some of the dark-flowered varieties.

The habit and foliage of the plant are quite novel among Rhododendrons, and approximate much more nearly to those of some Azaleas. This will especially be seen in the young lateral shoots exhibited in the figure, where the form, disposition, and hairiness of the leaves very much resemble the same features in most of the Indian Azaleas. The flowers, nevertheless, are decidedly those of a Rhododendron, and for their size, delicacy of tint, and the fine yellow spotting in the upper portion are almost without a rival.

Mr. Gibson discovered it on the side of the mountain, growing in thickets. The *R. arboreum* was also abundant in the same locality. Our subject there assumes the character of an under-shrub, and does not grow so erectly as it has done under cultivation in this country. The natural soil in which it flourishes is composed principally of loose granite and sandy loam, and is generally much interspersed with masses of rock.

In England it thrives well in the soil ordinarily used for greenhouse Rhododendrons, which consists, for the most part, of loose sandy loam, with the addition of about a third or a fourth of fibrous heath-mould. The roots of Rhododendrons will not endure too great an exposure to solar light and heat in the summer, and hence, if they are not in some degree shaded, the plants should be kept in a house whose aspect or mode of construction affords them a slight protection from the sun's rays. They require a very large supply of water in hot weather, particularly while flowering. Cuttings taken from the young or half-ripened wood of this species root freely in sandy soil; and it may doubtless be propagated by grafting on the common sorts.

Rhododendron is taken from *Rhodon*, a rose, and *dendron*, a tree, in reference to the large clusters of rosy flowers which many of the species bear.



Coleus barbatus.

CÒLEUS BARBÀTUS.

(BEARDED-FLOWERED COLEUS.)

CLASS.	ORDER.
DIDYNAMIA.	GYMNOSPERMIA.

NATURAL ORDER.

LABIÀTÆ.

Generic Character.—*Calyx* ovate-campanulate, erect, or often declinate or reflexed in the fructiferous state; throat naked or hispid, five-toothed, upper tooth membranous, with the margins rarely decurrent; lower teeth narrowed, all acute, or the lateral ones ovate-truncate; the two lowermost ones often combined. *Corolla* with an exserted defracted tube, an inflated or equal throat, and a bilabiate limb; upper lip short, bluntly three to four-cleft; lower one entire, elongated, concave, usually boat-shaped. *Stamens* four, declinate, lower ones the longest; filaments toothless, connected at the base into a tube, which sheaths the style; anthers ovate, reniform, with confluent cells. *Style* subulate at the apex, equally bifid; stigmas subterminal. *Achenia* roundish, compressed, smooth.

Specific Character.—*Stem* suffruticose, ascending, tomentosely hispid. *Leaves* petiolate, ovate, crenated, narrowed at the base, clothed with soft down when young, hispid; floral leaves membranous, broadly ovate, acuminate, comose at the tops of the racemes, deciduous. *Racemes* simple; whorls six-flowered, distant. *Calyx* hispid; upper tooth ovate, subdecurrent; lower tooth lanceolate, acute, nearly equal. *Lower lip of corolla* large, stipitate, boat-shaped.

Synonyme.—*Plectranthus barbatus.*

Having met with this pretty plant in the autumn of last year in a condition which gave us a high opinion of its ornamental character, we were led to figure it from this circumstance as well as from its apparent rarity. The collection in which we saw it so favourably developed, and to which we owe our present drawing, is that of Mrs. Lawrence, Ealing Park, where it is cultivated to great perfection in a stove.

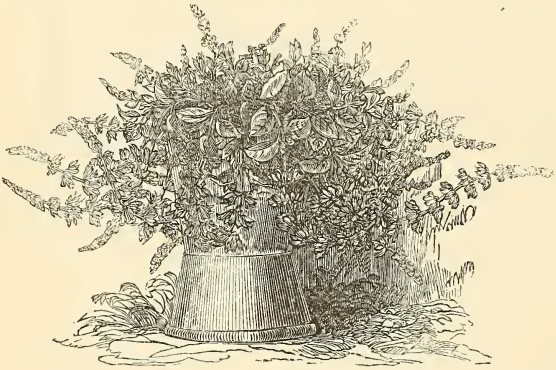
The plant grows to a foot or eighteen inches in height, producing many stems or principal branches, which have an inclination to recumbency, curving upwards, again, at their extremities. The flowers are borne in whorls of six, on a long spike, and a considerable quantity are opened at the same time. They also retain their beauty for a lengthened period. The regularity with which they are arranged round the stem, the singular form of the corolla, and the varied colours of the parts of fructification, being all well exhibited by their rather unusual mode of growth, (the lower lip of the flower turning downwards, and showing its interior from above,) present a very interesting appearance.

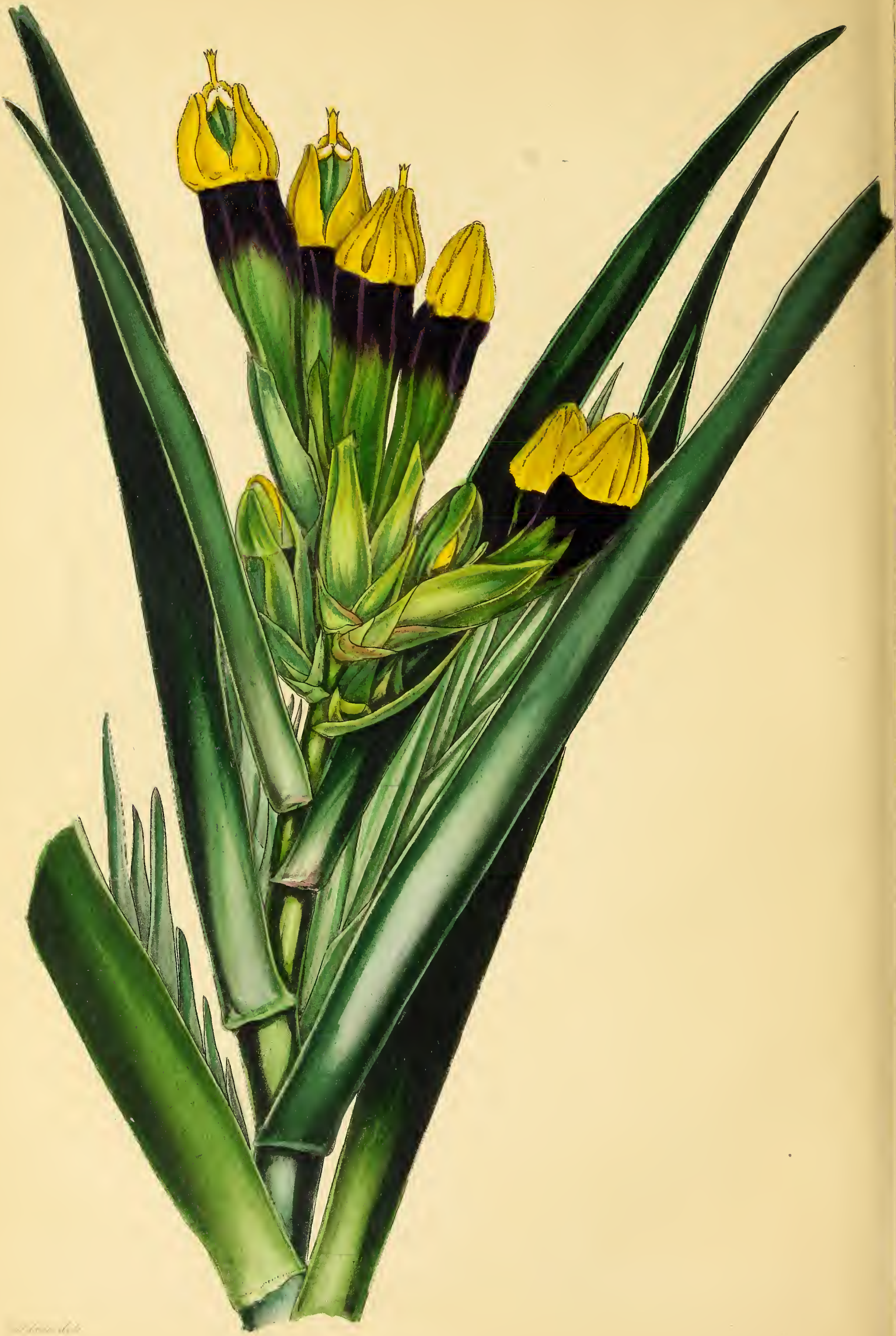
The species is said to have been introduced from Abyssinia, in the year 1806; but it is also a native of various parts of India, such as Mysore, Bangalore, Nepal, &c., where it is found in mountainous districts. In consideration of this fact, we think it probable that it might succeed in a greenhouse, or at least in one of intermediate temperature between that and the stove.

It is a shrubby or subshrubby plant, delighting in any common mixture of loam and peat, which is of a light porous description, and adequately drained. Only a moderate-sized pot is demanded, and a liberal supply of water in the growing season. It must be kept tolerably dry in the winter, or the shoots will be injured.

Its flowering period is from August to November, during which time it bears a great profusion of blossoms, which, besides the pleasing features before pointed out, are beset with white hairs. These, on the blue ground, have a very neat effect. Propagation is performed by cuttings. The subjoined woodcut will furnish a better illustration of its general aspect.

The generic name is derived from *koleos*, a sheath; the filaments being connected at the base into a tube, which sheaths the style. By this peculiarity, the genus is easily distinguished from all others of the order.





Witsenia maura

WITSÈNIA MAÙRA.

(DARK-FLOWERED WITSENIA.)

CLASS.
TRIANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
IRIDÀCEÆ.

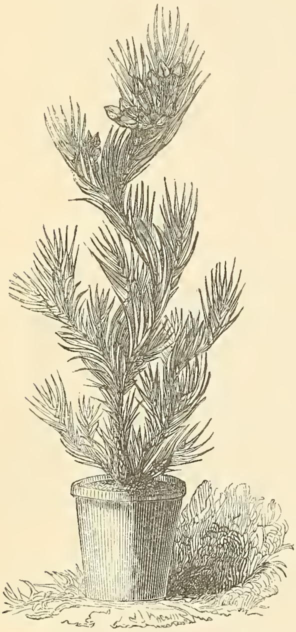
GENERIC CHARACTER.—*Calyx* none. *Corolla* erect, regular, nearly equal, persistent, tubulose, with a five (rarely six) parted limb. *Stamens* included, erect, affixed at the base to the exterior lobes. *Germen* inferior, or partially superior, many-seeded. *Style* filiform, exserted. *Stigma* obsoletely three-lobed. *Capsule* woody, ovately-trigonal, three-celled, three-valved ; valves bearing the seeds in the middle. *Seeds* in two rows, angular.

SPECIFIC CHARACTER.—*Plant* an evergreen shrub, growing two feet high and upwards. *Stems* erect, branching slightly. *Leaves* embracing the stem at the base, long, thick, channelled, acuminate. *Spathes* unequal, arranged in pairs on a common peduncle, distichously spicate, or sessile on the end of the stem ; each pair having foliaceous, distichous, imbricated scales. *Corolla* cylindrically club-shaped ; tube green, somewhat rough, becoming blackish at the top, four times longer than the limb ; lobes ovate, attenuated ; exterior discoloured, covered with short yellowish down ; interior streaked with yellow near the summit.

No general observer who is acquainted with the delightful *Witsenia corymbosa* would imagine that this singular species belonged to the same genus, were there not a trifling similarity in the appearance of the foliage. The very curious flowers of the present plant are so different from the apparently simple blue blossoms of its ally, that a botanist, or one skilled in the knowledge of botanical characters, could alone recognise the affinity.

Mr. Masson first sent plants of this species to Kew Gardens, in 1790, from the Cape of Good Hope, and it blossomed originally at Messrs. Lee's of the Hammersmith Nursery. Its cultivation has never been much extended ; but latterly it has been lost to the majority of collections. Indeed, though the accompanying representation was made at Messrs. Rollisson's, Tooting, about two years ago, their plant, which was then a fine specimen, has subsequently perished ; and we believe it is in few of the Metropolitan nurseries, except Mr. Low's of Clapton, who informs us that it bloomed with him in the late summer.

In its manner of growth, as we have above observed, it is not unlike *W. corymbosa.* The stems are, however, much stronger, the leaves thicker and larger, and confined more to the summit of the stem, while it attains a greater average height, and is less bushy. The flowers are, nevertheless, its most remarkable features. They proceed in pairs, from imbricated sheaths at the apex of the stem, and have a peculiarly long tube, which is green on the lower part, and gradually merges into a blackish purple at the top. From this colour the specific name is applied. The limb of the flower is bright yellow, but, as far as we have been able to determine, the lobes never expand, and it is always seen in the closed state shown in the figure, with the germen and its style protruding slightly beyond. The woodcut, as it includes the entire plant, will afford a notion of the common habitude of the species.



With regard to cultivation, it should be potted in a soil composed chiefly of turfy heath-mould, to which may be added a little open loam and sand. The plant must on no account be overpotted, and particular caution is requisite to preserve it from superfluous moisture, which, if allowed to collect either in the air or about the roots, inevitably kills it. It should be placed in a light, dry, and airy part of the greenhouse, and if thus managed, there will be no danger of its being destroyed. Cuttings of the young branches may be struck in a moderate heat, if dampness be properly avoided.

The genus commemorates M. Witsen, a Dutch patron of botanical pursuits.

OF GARDENING AS A SCIENCE.

NO. X.—LIGHT.

It is not our object to undertake the investigation of this most mysterious principle as connected with optics, or the doctrine of colour; we treat of vegetables and the phenomena elicited by the natural agents (of which light is the chief) upon their organic structure and developments; nevertheless, it will not be irrelevant to allude to the interesting experiments of Sir Isaac Newton, the late Sir William Herschell, and others, so familiarly known to philosophic readers, by which the divisibility or decomposition of a ray of white solar light has been proved, and the different heating powers possessed by the ray, when so divided, exhibited.

When a sunbeam is made to pass through a triangular piece of polished glass called a prism, an oblong image termed a spectrum is produced, which displays on a white screen seven primitive colours, namely, red, orange, yellow, green, blue, indigo, violet. The white sunbeam, as every one knows, produces a sensation of heat on the hand, though it communicates no degree of warmth whatever to a piece of glass; as, for instance, a burning-glass, through which it passes. But Dr. Herschell found that the decomposed ray exhibited very different degrees of heat; thus, "on applying a delicate thermometer it is seen that the blue ray scarcely affects it all; in the green it rises, and in the red shows an increase of several degrees. Assuming the heating power of the violet rays at 16°, that of the green is 26°, of the red 55°; but beyond the red ray and the limits of the visible spectrum the increase of temperature is still greater."

These phenomena, though inconclusive, are yet interesting, and have become more so from the recent observations of Dr. Horner of Hull, by which it has been rendered probable that glass of different prismatic colours may be made available to the gardener in effecting different objects: thus, blue glass is supposed to favour the first principles of growth, and to promote the germination of seeds, and, by inference, the protrusion of roots from cuttings; while the red, or heating colour, and the brilliant illuminating yellow, are more favourable to the processes of maturation. Facts however are required to establish and apply the hypothesis: in the mean time we feel it right to mention, that during the months of June, July, and August, 1841, we kept a number of healthy young pelargoniums in a pit facing the north-west, the glazed lights of which were coated on the inside with a bluish wash to prevent the drying influence of the afternoon sun. The foliage and verdure were much increased, and almost all the plants showed flower-buds; but, strange to say, the figure of these in many instances changed, the trusses flattened, and the blossoms did not expand, appearing as if absorbed, and finally passed into growing shoots. We called the attention of friends to the phenomena, and of their correctness there could be no doubt; several plants did not bloom, others produced but one or two flowers, and all would have failed had we not thrown the pit open to light and air. Whether the blue tint produced any specific effect remains in doubt; but such were the consequences of the experiment.

Some years since, we offered a few opinions upon the nature and offices of light, which, in the main, we see no sufficient reason to retract, more especially since we have perused the series of articles upon electricity, which are now publishing in that useful periodical, *The Magazine of Domestic Economy*; and we earnestly solicit the reader to peruse these articles, as we believe them to comprise the most lucid view of electrical science which is to be found in print.

The unity of creation, the universality of light, seem to require, and, indeed, prove, that one simple, vivifying principle is, and has been, in active operation from the commencement of time. Professor Playfair once observed, "If we consider how many different laws seem to regulate the action of impulse, cohesion, elasticity, chemical affinity, crystallisation, heat, light, magnetism, electricity, galvanism; the *existence of a principle more general than these*, and connecting *all of them with that of gravitation, appears highly probable.*"

Such was the almost prophetic suggestion of our late philosopher. Professor Leslie presumed that *the globe* was "*cavernous, replete with light, shining with intense splendour.*" But if, as we believe to be the fact, *solar light* is the only ethereal essence or matter which pervades all nature, we require no such cavernous, central magazine of it; neither need we perplex our minds concerning the source of effulgence, for the *sun* stands revealed to all, and the life and activity of all creation depend upon his beams. "*Let there be light,*" was a word of power, view it in what way we please, for the life of all created things was included in its fiat; and there is not one act of progress or increase, of respiration, decomposition, motion, electrical or chemical action, that is not, and ever has been, dependent on it for its commencement, continuation, and completion. Let those who doubt consider the glorious orb, whose beams have been poured upon the planetary system throughout time; let them, with the eyes of a philosopher, view the mighty phenomena of development and increase that are manifestly the result of his power, and they will find themselves constrained either to admit that *light is absorbed* by the bodies upon which it strikes, or that it becomes extinguished and lost; the latter conclusion would be subversive of the analogy of all nature.

But if the beams of light be absorbed, they must of necessity lie masked or concealed till excited by some powerful agent which disturbs the natural equilibrium; and such disturbance is of every-day occurence in every act of percussion, abrasion, motion, chemical action, and so forth.

The *theory of light*, therefore, involves the following positions:—Its source is the *sun*, whence its diffusion is universal. The primary effects of light are the distribution and modification of electrical, magnetic, and chemical attraction and repulsion; and the secondary are the phenomena of *gravitation* acting by the laws of electric induction. For as all bodies, when electrified, produce an opposite state in other bodies within the range of their inductive influence, so the sun, being the fountain of pure ethereal light, electrises all bodies, (primary or secondary,) and produces a condition in such bodies, which causes them to attract each other, and to be attracted themselves, universally and interchangeably.

When we come to the subject of electric, vital action, we shall perceive how these opinions, indicated above ten years since, are borne out by the excellent articles now in series, as before said.

We may not be able to withdraw the veil of mystery, but the experiments of Faraday have been quite conclusive of the fact that a stupendous quantity of electricity combines with the elements of matter, and gives them form and consistence; in other words, retains them in their natural condition and order. This electricity is derived from the sun, water and the metals being in all probability the media of absorption: and as all light flows from the sun, that luminary is the *first grand connective principle.*

Light, we have said, pervades, imbues, influences all things. True, we do not perceive it in a drop of water, yet water contains the elements of tremendous combustion. Flint does not manifest light, neither does steel, yet who can doubt their excitability by percussion? Hydrogen gas, the lightest of all known airs, is invisible; yet let a stream of it be projected through a fine aperture upon a bit of spongy platinum, the cold metal will be heated, and ignite the gas. A piece of glass, and a small square of black silk, are both inert and cold bodies, yet, by the friction of the two together, they will exhibit sparks of ethereal light. A portion of white sugar mixed with chlorate of potass in the state of powder, will burst into flame on applying a small drop of concentrated sulphuric acid. On the same principle, the percussion-caps of guns, and the modern lucifer matches, act as excitable media of masked electrical light.

The theory of *latent heat* will vanish into thin air, as the principle of solar, electric light becomes appreciable. Philosophers are advancing on the road, but like the world, they cleave to old prejudices. We must be thankful for what is accomplished—for what Davy effected, and Faraday improved and enlarged. Yet we are far from the simplicity of science.

Light, as applied to plants endowed with vitality, is an active principle; they drink it in, and colour is imparted to their foliage and flowers; but it is a mistake to suppose that the direct ray is always essential, for diffused light acts perfectly well on many vegetables; and even in a dark cellar a rhubarb plant exhibits gorgeous tints of red and yellow. But the air itself is replete with lights, and this medium cannot be excluded.

Inert vegetable matters, void of life, as straw, haulm, dry wood, are vehicles of this mighty principle, which requires only a spark, or even friction duly applied, to rouse it into activity. They then burst into rapid combustion, and produce substances, the existence of which could be no more suspected by the ignorant, than was the light which blazed from a dark mass of lamp-black, excited to spontaneous combustion (as it is weakly termed) by electro-chemical agency.

Light, it appears, is to vegetables the stimulus of the vital principle; its operation during the day affects the elaboration of the elements of water and carbon, producing the specific essences of the individual species. It is the chief agent of maturation, as well as of colour; its absence during night, and in winter, produces torpor; and repose is as essential to plants as to animals. We cannot precisely trace the direct agency of light, because plants made the subjects of experiment are always placed in artificial situations; but we shall not fail, from the observation of natural phenomena, to conclude that, every material change in the fluids is chemical—if chemical, it must be electrical—and if electrical, we are inevitably led to the primary fountain of light. Thus all is harmony, perpetual routine; verdure, maturity, all referable to the one great principle—the Sun!

CULTURE OF A FEW ORNAMENTAL PLANTS.

In resuming our rambling notes on plants of this class, we may primarily advert to *Lisianthus Russellianus*, a species about which cultivators are very generally agreed in considering that it is one of the most difficult plants to preserve through the winter at present known. Being of biennial or perennial habitude, and never flowering before the summer or autumn of its second year's growth, it is thus impossible to avoid keeping it at least one winter, and consequently the difficulties experienced must be fairly met and overcome.

Unlike most other exotics, it seems incapable of reposing during the winter months, or of subsisting without the ordinary supply of heat and water. No plant is more susceptible of injury from cold; as a low temperature, even when frost is excluded, will sometimes cause it to wither and die away entirely. The slightest drought in the soil also appears productive of the same results; and we have observed the half of a fine stock of plants destroyed in the winter from one or both of these circumstances. In its decay, too, it is quite peculiar; for as soon as the lower leaves begin to shrivel, without turning yellow, its loss may be calculated upon as inevitable, since it never recovers, and the mischief is speedily manifested on the whole plant.

We have seen many attempts, of various kinds, made to retain it in health for the winter season; but those which have been most successful have always been based on the principle of keeping the plant constantly in a growing state; and though we have no doubt other cultivators may have succeeded by adopting a different course, not having witnessed their systems, we can neither describe nor recommend them.

To excite a plant to constant growth while nature is exerting her utmost rigours, is usually and justly deemed irrational by the majority of culturists; and when the species is of a succulent nature, the danger is thought to be much increased; but in this case the practice must be tolerated as a necessary evil. Specimens raised from seeds in the spring, summer, or autumn, should be brought into as healthy and robust a condition as possible before the winter commences, and to effect this, they may be exposed to a colder and drier atmosphere than they would bear at a later period; though they should never want water at the roots. After potting them occasionally, as they may require it, into an enriched loamy earth, with only a small proportion of sandy heath-mould incorporated, they may be placed on a shelf near the glass, in a warm part of the stove, and must be watered very carefully whenever water is needful.

To maintain a regular supply of moisture, and likewise obviate the necessity of pouring water on the soil, so as to endanger the rotting of the plant at its base, some culturists furnish each pot with a flat or pan beneath, filled with water. We have known the species preserved in this way with the greatest security; it being a fact with which most growers are familiar, that the mere application of water to the surface of a pot in which a delicate plant is growing, often causes it to decay just at the junction of the stem and roots.

In very frosty weather, it is necessary to place an external covering of mats or tarpawling over the spot where this species is placed; because, being so close to the glass, and in such a susceptive state, the slightest cold would immediately kill it.

Having by these means kept it alive till spring, the first operation to which it should be subjected about the end of March, is the careful removal of whatever portion of the shoots may have been formed in winter, after which the plant can be repotted, and treated in the ordinary way; always, however, with a due regard to its love of sufficient moisture. In enjoining attention to this last circumstance, we must, nevertheless, distinctly state that the species will as surely be injured by excessive dampness as by drought; and that the only guide to a proper quantity is the amount of heat existing in the air, and the actual appearance and wants of the specimen.

The advantage accruing from the decapitation of the plants will not only be the cutting away of their sickly winter's growth, but the development of a greater number of principal shoots, by which the beauty of the specimens, and the quantity of flowers they produce, will be greatly augmented. Indeed, it is even desirable to stop the leading shoots while the plants are yet young, in order to induce a similar bushiness and abundance of blossoms.

If this *Lisianthus* be suffered to produce seeds in the autumn after flowering, it will prove no more than a biennial, and at once perish. But with those plants from which seed is not desired, the best plan of treatment is to cut them down directly the flowers fade, to within two or three inches of the soil, when they will form a number of new shoots before the winter, and bloom again most profusely in the succeeding year.

Should any of our readers have been able to grow this plant in the greenhouse, we shall be glad to learn what method they have adopted for carrying it through the winter, and what proportion of their stock is annually lost during that period. By the system of putting the pots in flats of water, and giving them a moderate stove heat, we do not think a single one has failed in the places where we have seen it practised.

In some of the London nurseries, and in a few private gardens, we have been particularly pleased this last summer with standard plants of *Cytisus nigricans*, a species that produces its long spikes of small yellow blossoms through the months of June, July, and part of August, and contributes not a little to the gaiety of the border or parterre. The mode of obtaining it thus, is to graft it at the usual time on stocks of *Cytisus Laburnum*, (the common Laburnum,) which may be three, four, or five feet in height, according to the purpose for which they are destined, and about one-third or half an inch thick. As the shoots of *C. nigricans* grow out very regularly, are not more than nine inches or a foot long, and constitute a beautiful round head, the species so treated is peculiarly well adapted for planting in the parterres of geometrical flower-gardens, on lawns, terraces, or other places where formal figures or straight lines prevail. From its great beauty, moreover, an additional incentive is afforded to its cultivation, and we here mention it with the view of making it more generally known as a highly ornamental shrub. When grafted in the manner we have suggested, it will require pruning yearly, in a similar way to standard Roses; for by cutting in the shoots, their number is greatly increased, and the head rendered much more dense. Especial care must also be taken to prevent the stock from developing branches. Being so much stronger than the species grafted upon it, the latter would soon be exhausted or smothered were the shoots of the former allowed to grow.

As the fashion of turning out half-hardy exotics into the beds of the flower-garden has now become thoroughly established, and as every accession to the list of those already employed in this way must be interesting, from the enlarged facilities for making a fine, symmetrical, or varied display which it places within the gardener's power, it may be well to mention that the *Malva Creeana* is an exceedingly suitable plant for such an object.

Its habit is that of an under-shrub or suffruticose plant, the upper part of the stems being succulent and inclined to be what is called herbaceous, and the lower portions harder and more woody. Young plants of this species transplanted in spring into a moderately rich bed, if their more straggling shoots are pinched off, or pegged down to the earth where necessary, will soon cover the surface, and intermingle with each other in a dense mass, flowering all the summer and autumn. So treated, their branches and leaves assume a luxuriance and health which they never acquire in a pot; the flowers are larger and handsomer; and the whole plant presents an aspect greatly superior to that which it exhibits in ordinary cultivation.

To perpetuate it, cuttings of the more woody shoots are made in the autumn, struck in the same way as those of Verbenas, &c., potted into small pots, and stored through the winter in cold pits or frames. All the flowers that show themselves on the young plant should be taken off while in the bud, and, in the month of March, when it begins to grow, the point of every main shoot is to be abstracted, that the stock may be prepared with an abundance of laterals when the time for transplantation arrives, and so be ready at once to cover the ground for which it is intended. This is a point which is but rarely attended to, though persons who neglect it are little aware of the difference it occasions in the appearance of their flower-beds. Where it is disregarded, the plants never spread properly over the soil, but commence blooming early, acquire a weakly character, with long weak stems requiring support, and lose their beauty before the season has even reached its meridian.

Among the comparatively recent introductions from Japan by Dr. Siebold, is a very noble species of *Aralia*, designated *A. japonica*, which is in most of the London nurseries, and was blooming most prodigally a few days since at Messrs. Young's, Epsom. It is remarkable for the strength of its stems, and more particularly for the great size and boldly expansive character of its magnificent foliage; and as it has proved perfectly hardy, on a trial of two or three years in the open border, without shelter, it may be relied on for planting in any garden, at least near and south of London, and, most probably, throughout the country. In the event of its not being hardy enough to endure the winters of northern districts, it would be easy, from its deciduous nature, to protect it with a covering of mats or the like material.

Our more immediate purpose in referring to this plant, next to sketching its general features, is to point out its adaptation to the designs of the pleasure-gardener, in disposing it on lawns, in conspicuous positions, or planting it in those more retired corners of the pleasure-grounds where it can stand isolated as a specimen plant, and at the same time be beyond the shade of other shrubs or trees. Its stately, erect stems, which, with the ample and equally noble leaves, are covered with large spines, render it a no less ornamental than curious object; and we are sure that it would be greatly admired, in the situations we have indicated, both for its pleasing individual character, and for the contrast between it and the smoothly-shaven lawn, as well as the commoner forms of vegetation, and the more showy specimens or groups of flowering plants by which it would be surrounded. It seems to flourish in any garden soil, unquestionably preferring one which is of a loamy and not too sterile nature, and of which the substratum—supposing this to be clay or gravel—is not too near the top. In either of the latter cases, it will be better to form a pit from two to three feet deep and four feet in diameter, fill it with fresh loam, and plant the specimen in the centre.

Of all the climbing plants which adorn the greenhouse and stove, there are not many which surpass the elegant species of *Passiflora*. It is to be regretted, however, that so many of them appear to require a high temperature, while only a very limited proportion will flourish in the cooler houses, with which alone many small places are furnished. Hence the lesser cultivators, who would gladly comprise such beautiful things in their collection if they could be induced to thrive in the sole receptacle they possess,—a common greenhouse,—have to forego that pleasure on account of their tender nature.

If the fact we are about to submit should have any tendency to alter the general impression regarding the tenderness of Passion-flowers, and so facilitate their admission to greenhouses more universally, or prompt individuals who have no stove to experimentalize on their capacity of enduring cold, we shall be exceedingly gratified; because we consider that, by demonstrating that a handsome plant or tribe of plants may be grown with less heat than is usually given, a grand point in its culture is gained.

The species concerning which we now have direct evidence to offer is *P. quadrangularis*, (or *Buonapartea*,) a plant which, from the freeness and richness of its growth, and its palpably tropical character, may be reckoned one of the species which would seem to demand the highest temperature; and which, from the same considerations, would be thought least likely to submit to greenhouse treatment. A plant, however, in the conservatory of Colonel Long, Bromley Hill, Kent, has, this summer, bloomed in the usual prolific manner, and the flowers were even somewhat larger than they commonly are in a stove, and very much richer in colour. The specimen, from its size, has no doubt stood there several years, and is planted in one of the borders of the interior. At another place in Kent, we noticed a specimen of the same species in a greenhouse, and the foliage and flowers were fully twice the ordinary dimensions, the latter being of a most superb colour; but the blooms were scanty, and late in making their appearance.

On comparing the conditions in which the plant was kept at both these seats, we perceived clearly that the liberality with which the first bloomed, and its similarity in beauty to the stove state of the species, were attributable to its being grown in a conservatory, attached to the residence, higher and darker than the structures distinguished as greenhouses, and, not being so freely ventilated, having a somewhat moister atmosphere. Wherever, therefore, the same conditions can be realized, we may venture to assure the reader that there can be no risk in cultivating this superb plant; and would further suggest that, as others of the genus come, for the most part, from similar latitudes, they may most likely be subjected to an equally diminished temperature with the like satisfactory results.

GARDEN ARCHITECTURE.

Having spoken of the general style and site of plant erections, and fully explained our views of the principles which should guide the floriculturist and landscape gardener in each of the points, we must now descend more into the actual composition of the building, and discuss its individual features.

The outline of plant structures has necessarily varied much with the changes in popular taste, and the peculiar opinions of the persons forming them. In one particular, however, we believe we have reasons for assuming that the leading professors and patrons of the art at present universally concur; and this is that the one-sided style of buildings so general in an earlier stage of floricultural progress, should be at once abandoned in all future operations of the kind; and that whether the plan be a circle, an oval, a parallelogram, or any other figure, both sides should be made of corresponding materials, and of a precisely similar contour.

Of course we here refer only to detached houses or groups of houses; as we have before said that those which adjoin the mansion ought to assimilate in some degree to its distinguishing character, and positively constitute a part of it.

Several reasons may be given why plant-houses should be the same on both sides, and we shall just touch upon the chief of these. It may be confidently asserted that taste demands it, while it is more convenient and necessary in various ways to the health of the plants. With respect to appearance, no one can dispute that a building of equal parts and proportions is infinitely superior to one of which the back is either a tall, upright, blank wall, or a series of sheds. The one possesses symmetry, while the other is totally destitute of all proportion; the one appears perfect and finished, the other seems wanting in some essential part; in short, the first, if properly designed, is calculated to gratify the eye of taste; but the last cannot, under any modification, so long as it retains its distinctive form, do otherwise than annoy it.

Of the greater convenience of a symmetrical house, little need be stated, as it must be manifest that for the disposition of the walks, and the arrangement of the plants, so as to be easily tended and to exhibit themselves most favourably, as well as for heating and ventilation, it has many advantages. For example, a house of the ordinary oblong figure, with what is termed a span roof, may have a broad shelf or stage all round the inside of the walls, and a larger stage or bed in the centre, with a walk between the two. On these stages the plants can all be placed so as to be near the light, to present a pleasing aspect on all sides, and to be readily watered, pruned, or removed from the walk. Again, in respect to the heating apparatus, if placed at one end or side of the house, and the pipes made to pass round it under the outer stage, or the flues carried along beneath the walk, every part of it will be at hand at any time, for the purpose of alteration or repair, and the house will be more regularly and effectually heated than if there was only one slope to the roof.

That plants can be grown to greater perfection in a span-roofed house, and kept in a more healthy condition, with the least attention, is a matter of notoriety. Its lightness, and its thorough ventilation, are two of the main causes of its superiority; and every gardener is aware that, for greenhouse plants at least, light and air are of vital importance; while for all exotics it is essential that the former should be fully at command, though it may be desirable at times to diminish its influence by artificial means.

It has often been declared, that it is of little moment whether the back wall and ends of a house facing the south be glazed or not, provided the slope of the front roof be such as to receive the direct rays of the sun during the greater part of the year. This fallacy is completely refuted by modern experience, which attests that the more thoroughly exotic plants are surrounded by materials which admit light freely, the more nearly does their state approximate to that of nature, and the more dwarf, dense, and robust are their developments. Indeed, we may mention that though the old notion of gardeners, that high houses are most improper for plants, is correct when applied to those which have one or more of their walls opaque, and composed of bricks or masonry; yet if every portion of the roof be glazed to within a few feet of the ground, it has been found that the attenuating and etiolating effects of which cultivators formerly had to complain in lofty erections, have not been experienced, and the plants grow as strongly, and remain as compact in their habit, as if they were merely a few feet from the glass.

In houses of this description, such is the power of solar agency, that a difficulty of quite another nature has to be encountered; for the rays of light and heat being transmitted so perfectly, render the protection of the roots of potted plants almost indispensable. Still it is important to observe that the atmosphere does not, as some have supposed, become heated to an uncomfortable degree; because the solar rays, having no solid or massive substance to act upon, (as in the case of houses with brick walls at the back,) are but slightly refracted by the glass, and pass through the house rather than concentrate themselves within it. Hence, a house glazed on all sides, if adequately ventilated, will really be cooler in the summer than one which has a single glass slope with a southern aspect and an opaque back wall.

Not wishing to dogmatize on any subject, especially on one of such consequence as that of building plant-houses, we will strive to meet the objections that have been or may be urged against having two glass slopes to a roof. It appears to us, however, that these may all be ranged under the single head of *economy;* and as we think this a matter of considerable interest, we shall attempt to show that the economical argument has exceedingly little to substantiate it: whereas, when weighed against the immense benefits conferred by the other system, the question assumes quite a contrary aspect, and the saving is clearly on the side we advocate.

Many false views are current respecting the nature of true economy in the construction of plant-houses. By not a few whose opinions are entitled to much respect, it is made to consist almost wholly in the primal outlay, or actual expense of erection; no allowance being made for the comparative liability of certain methods to injury or decay, or to the varied amounts requisite to keep them in due repair. Clearly we pronounce such estimates of economy to be raised on a false foundation.

But there is another and more prevalent species of error to which builders and even the great majority of culturists are prone in calculations of that sort. We allude to the very frequent forgetfulness that, since the houses are made for growing certain plants, and since the plants are the real property, which is simply to be conserved by their erection, that plan of building which most rapidly increases their beauty, and consequent value, will, in proportion to the benefits so conferred, compensate for the extra original expense. On the other hand, in estimating the cost of a structure, the worth of the specimens lost, and the additional value which the remaining plants would have acquired in a superior erection, ought fairly and undoubtedly to be added to the expenditure upon an unsuitable building, which was constructed for a lower price.

After the above explanation, it will be superfluous to say more than that we include in all our calculations of expense, the ultimate effects of the plan pursued upon the final objects of care—the plants. Now, we maintain, from indisputable data—which any one may verify by personal experiment, or by visiting places in which exactly the same modes of cultivation are followed, but in houses of the two opposite classes to which we have pointed—that the improved health of the plants in greenhouses with two glass slopes to their roofs, is, in only three or four years, more than enough to repay the additional sum expended in their erection, supposing this were as great as the most extravagant economists affirm it to be. That it is really very trifling, or does not admit of proof, we proceed to demonstrate.

Taking for our subject a span-roofed house of determinate dimensions, with either one or both ends glazed, and upright side sashes of from three to four feet in depth, all the latter adapted for opening, and the top lights capable of being let down or removed, we shall have a structure which, for appearance and for practical purposes, cannot well be surpassed. Let us then imagine a lean-to house of the same length and breadth, with similar glazed extremities, and an equal depth of upright sash in front, (for few will have the hardihood to say that front and end lights can be dispensed with,) and it will be seen by measurement, that, on account of the greater height necessary in the latter, the length of slope in its roof, and the additional glass consumed at the ends, it will give quite sufficient to glaze the opposite slope of a span roof, while the expense of the back wall will surely allow for the remaining side lights of a span-roofed structure, and thus the cost of each is equalized, without reckoning how many more plants the one we recommend would accommodate.

We hope, if our investigation has been tedious, it will not be deemed useless;

because, when it can be proved (as we imagine we have done) that a more beautiful house, and one very much better adapted for growing a greater number of plants to higher perfection, can be erected for the same, or, allowing a little more for ornaments, a trifling extra outlay, there can henceforth be little doubt as to which form the more enlightened proprietor will prefer.

To render a span-roofed house such as that we have been delineating in some measure architectural, or, at any rate, not unworthy of an ornamental garden, the addition of four cast-iron fluted pillars, with capitals of one of the simpler orders at the ends, and the formation of the frame-work of the house above them into the outline of a pediment, (the whole being so slender as neither to give the house a heavy aspect, nor materially shade it,) would at once transform it into a Grecian edifice, and add greatly to its beauty. Or, a few neat wooden ornaments, judiciously placed along the top, sides, and ends, would cause it to assume something of a more Gothic or Tudor character, and impart a finish which would else be lacking. In the effectuation of these improvements, the greatest taste will be requisite, and the designer must be fully imbued with the necessity of avoiding whatever would tend too much to obstruct the passage of light.

Desirous of finishing our picture of what we should reckon a perfect house of the span-roofed kind, we may observe that everything massive or inelegant is nearly as much to be deprecated in the interior as on the outside. Still, the materials used should be substantial and enduring. To ensure both these ends, the stages immediately within the walls can be made of slate slabs, about one third or half an inch in thickness, and sustained by thin pillars or bars of iron, set in stone at one end, while the other end is fastened into the wall. They should be from two feet and a half to three feet and a half high, or about level with the top of the wall and the base of the side sashes.

The walk of the house ought to surround a central compartment, which may be a wooden stage, a raised brick pit, or a bed, according to the nature of the plants to be cultivated. If they are greenhouse species, kept in a pot, a stage of ascending steps will be preferable ; the lowest being on a level with the opposite slate stage. The steps can be of the same breadth and distance from each other, up to the top, or with a very slight graduation in size from the bottom upwards ; as it is to be understood that the smallest specimens will stand on the outer stages, and those for the centre will not vary materially in size. For stove plants, or Orchidaceæ, an elevated brick pit will perhaps be most suitable, as this will admit of their being plunged in bark, or placed on any temporary surface that may be thought most congenial. Where, again, the object is to obtain large specimens, the middle of the house should be converted into a bed, wherein they can be planted at the most appropriate distances.

An interesting diversity, which we do not remember to have seen anywhere attempted, could be realized by expanding the principal compartment in the centre, and narrowing it at each end, altering the outer stages in the opposite ratio. The converse course might likewise be taken by contracting the chief division in the middle of the house, and making it broader towards the doors, with an indentation at either extremity. To have the house narrow, with a walk through the centre, is by no means advisable, except for nurserymen, whose plants are all small, and who sometimes disregard effect.

We shall conclude the subject in our next number.

FLORICULTURAL NOTICES.

NEW OR RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR OCTOBER.

Bossiæa dísticha. Apparently a much neater growing plant than the majority of the species, and having its leaves arranged in two rows up the stem. It is an erect shrub, of a rather feeble character, with pubescent branches and leaves, the latter of which are ovate, obtuse, and short, with small bristly stipules at their base. The flowers are comparatively large, and showy. "The standard is pale yellow, with a darker spot at the base of the same colour, bordered first with crimson and then with dusky red. The wings are stained with the same colour at the base, otherwise they are pale yellow." From seeds presented by Captain Mangles, R.N., to the Horticultural Society, plants were raised, which flower in March. It is a native of the Swan River district. *Bot. Reg.* 55.

Cœlógyne cristàta. This lovely species is justly considered to stand pre-eminent among the beautiful plants to which it is allied, and is one of the most charming of orchidaceous epiphytes. It has small pseudo-bulbs, which become angular when old, and are crowned with two long, waving, lanceolate leaves. The flowers rise in racemes from beneath the younger pseudo-bulbs, and are disposed in clusters of from two to five. They are fragrant, large, "of the purest white, except the lip, which in its centre is decorated with bright yellow fringes and plates." Their abundance, the dwarfness of the plant, and its extremely interesting appearance when in bloom, render it a most desirable species for cultivation. Sometimes the blossoms are more than four inches in diameter. Dr. Wallich found it on rocks and trees in Nepal, and it has lately flowered with G. Barker, Esq., of Birmingham. Messrs. Loddiges bloomed it two or three years since, and possess several specimens. It requires considerable attention to preserve it from injury, and thrives best in a damp part of the stove. *Bot. Reg.* 57.

Epidéndrum calochèilum. We suspect that this new species will be found very near one or two others previously described, and which are equally noticeable for what is deemed its distinctive feature—the pretty markings in the lip of the flower. To *E. alatum*, especially, it approaches singularly near. It is a handsome plant, with oblong, two-leaved pseudo-bulbs, and copious, erect panicles of flowers. The sepals and petals are yellowish green, stained with dull purple towards the apex. The labellum is three-lobed, the middle one being broad, wavy, and beautifully veined with reddish purple. Mr. Skinner having discovered it in Guatemala, sent it to the Woburn collection in October, 1839, "and it flowered in the stove in the same month of the following year." *Bot. Mag.* 3898.

Mormòdes pardìna. The noble flowers of this curious species, associated, as they are, so numerously and closely in the raceme, and being of a rich yellow ground, thickly spotted and blotched with deep red, compose a no less singular than splendid spectacle, and entitle the plant to a considerable share in the cultivator's regard. The species has the habit of a *Catasetum*, and throws up a strong, erect floral raceme from the bottom of the growing pseudo-bulbs. Its native country is Mexico, and it has bloomed in the fine collection at Woburn Abbey. *Bot. Mag.* 3900.

Órchis foliòsa. One of the few handsome Orchidaceæ which can be grown in the greenhouses of this country, and easily brought to a perfection which is unknown in its native state. A figure is given in Dr. Lindley's *Sertum Orchidaceum* from a plant that blossomed magnificently in the conservatory of William Wells, Esq., of Redleaf, and which grew three feet in height, bearing a pyramid of flowers more than a foot long. The blossoms are large, dense, purple, and exceedingly showy. It inhabits woods and thickets in the island of Madeira, and may be cultivated in a greenhouse, in a loamy soil, with proper attention to its times of development and torpidity.

Sálvia confertiflòra, *var.* A red-flowered variety of *S. confertiflora* is here represented, which is evidently the one now common in gardens, and it is stated that there is a yellow-blossomed kind. The plant is very ornamental, well suited for growing in the borders or on lawns during summer, but requiring to be entirely unencumbered by other plants, or it loses its symmetry. The leaves of this variety are said to be particularly acuminate, and the flower-spikes are of a great length. *Bot. Mag.* 3899.

Strobilánthes séssilis. "This plant, whose blossoms are very handsome, was raised at the Botanic garden, Edinburgh, from seeds sent by Dr. Lusk, from Bombay, in 1833, and flowered for the first time in October, 1839; but much more freely in April, 1841." It is an herbaceous perennial, clothed all over with hairs, and having numerous stems, which usually grow about eighteen inches high. The leaves are opposite, cordately-ovate, crenate, wrinkled, and concave above; while the flowers are solitary, sessile, situated in the axils of the bracts, and expanding in succession upwards, and several at a time. They are funnel-shaped, and of a fine bluish-lilac colour. *Bot. Mag.*, 3902.

Tabernæmontàna dichótoma. Growing twelve or sixteen feet in height, this species ranks as a small tree, and is described as a "most fragrant and beautiful stove plant, resembling a *Plumieria* in appearance. It is a native of Ceylon, whence we possess native specimens; according to Dr. Wallich, it also occurs in Malabar." The tree is of a handsome character, branching freely, and producing large as well as peculiarly dark and glossy foliage, with racemes of distant but spacious white flowers. The figure was obtained from Sion House, the seat of His Grace the Duke of Northumberland, and it is cultivated in a moist stove, with an enriched soil. Dr. Lindley observes, that "the sages of Ceylon having demonstrated, as they say, that Paradise was in that island, and having, therefore, found it necessary to point out the forbidden fruit of the garden of Eden, assure us that it was borne by a species of this genus, the Divi Ladner of their country, and probably the plant before us." It is assumed that before the fall of man the fruit was edible and delicious; but that it then became poisonous, as it now remains. *Bot. Reg.*, 53.

Tithònia ovàta. Sir W. J. Hooker has only assigned this plant provisionally to the genus *Tithonia*, till its affinity can be more accurately determined. As far as the culturist is concerned, however, it would seem to be of little importance to what genus it belongs, for its character exhibits few points of interest, the flowers being syngenesious, comparatively small, and of the usual yellow colour. It is a strong-growing plant, raised in the open air by Mr. Glover, of Manchester, from seeds imported from Mexico by his friend Mr. Leeds. It blossoms in the autumn. *Bot. Mag.* 3901.

NEW OR INTERESTING PLANTS WHICH HAVE RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Begònia Martiàna. A very handsome species, herbaceous or sub-shrubby in its character, and bearing a great number of beautiful blush-coloured flowers throughout the summer and autumnal months. The leaves are small, of the usual unequal figure, and not at all conspicuous; but the plant branches abundantly, and the blossoms are particularly large. It has bloomed in a stove at Messrs. Henderson's, Pine-Apple Place, for the last three or four months, and promises to remain still longer in flower; on which account, and for the superior size of its blossoms, which are generally more or less tinged with a deep pink hue, it is one of the best species of the genus.

Clerodéndron splèndens. Imported by Mr. Knight, of the King's Road, Chelsea, from Sierra Leone, and now blooming in the stove of that gentleman. From most other species of *Clerodendron*, it is immediately distinguished by being a climbing plant. It has little disposition to ramble, and bears opposite, simple, shining leaves, resembling those of *Poirrea coccinea* (the old *Combretum purpureum*), to which the plant is not remotely allied in habit. The flowers appear in clusters near the tips of the branches, and though not large, are of a splendid deep scarlet colour, which renders them extremely showy. The species seems inclined to blossom at an early stage of its growth, without, as is too frequently the case with climbers, producing a large quantity of wood, and extending itself over an immense surface. A succession of flowers is also being developed.

Colúmnea Schiediàna. This interesting new *Columnea* was introduced, we believe, by J. Rogers, Esq., of Seven-oaks, Kent, and flowered there many months back. It is at present in bloom with Messrs. Rollisson, of Tooting, and is likely to prove an ornament to the stove, or probably to a warm greenhouse. The plant is a robust dwarf shrub, with strong succulent branches, rather discoloured leaves, and large cream-coloured flowers, richly spotted and blotched with reddish purple. Its treatment should be like that of *C. scandens*, a very valuable old autumnal-flowering species.

Comparéttia rósea. Minute as are all the parts of this pretty orchidaceous plant, it is yet a highly elegant and attractive species for growing on suspended blocks of wood, and has intense rose-coloured or crimson flowers, which are large, compared with the size of the whole plant, and are very much like those of *Broughtonia sanguinea*, but about half the dimensions. They are borne on a drooping scape, and the species has blossomed during the past three months at Messrs. Loddiges'.

Gesnèra zebrìna. Many novel species of *Gesnera* have lately been added to the stock previously possessed; but whether old or new, few can vie with the above plant, which is flowering very finely in a stove at Mr. Low's, Clapton. The stems are succulent, and the leaves spacious, folded under at the edges, of a vivid green, with numerous broad and dark-blood coloured or purplish veins, which give them a particularly pleasing aspect. The flower-spike rises from the summit of the stem, and supports a pyramid of lively scarlet flowers, which are yellow in the inside and towards the base, and beautifully spotted in the throat. They are of a great size, numerous, and drooping; and the plant is altogether one of the finest stove exotics yet known to cultivators.

Ipomœa ficifòlia. This affords the probability of ranking among the most desirable of its tribe, from the amazing liberality with which it unfolds its blooms in a stove, during autumn and winter, and its singular adaptation for training on a low, flat, or circular trellis. Plants are just reaching perfection in the stove of Messrs. Henderson, Pine-Apple Place, and the quantity of buds which is continually forming is quite extraordinary. It has neat fig-shaped leaves, and develops its flowers in clusters. The individual blossoms are about three inches in diameter, retaining their beauty throughout one entire day, and of an indefinable colour, of which some notion may be gained by mixing blue, red, and lilac.

OPERATIONS FOR NOVEMBER.

In consequence of the prodigious quantities of rain which fell during September and October, and the generally wet character of the whole previous season, the dampness for which November is notorious will necessarily be very much increased in the present year; and the attention requisite for exotic plants must, from this circumstance, be more constant and assiduous. Many weeks ago, indications were apparent of a second production of bloom on various kinds of plants usually kept in houses, and even Rhododendrons, and other hardy shrubs, have, in some places, borne quite a profusion of blossoms.

Wherever unseasonable growth or inflorescence is now observable in plants which are at all beneath the cultivator's control, he cannot do better than continue to repress them, assured that the flowers borne thus prematurely will be at the expense of the usual display at the proper season. Unless, therefore, with a few comparatively worthless specimens, which may be permitted to bloom for the sake of rendering the houses a little gay at this time; or such as, like *Clianthus puniceus* and some others, form their blooms in the autumn to be expanded in spring, every disposition to blossom in plants whose flowering period is the spring or summer, should be kept under by the removal of the buds as soon as they show themselves. All extra growth should likewise be picked off, as imperfect shoots weaken the plant, are very apt to become mildewed or to suffer from dampness, and to spread their decay to the more healthy portions with which they are connected.

This destruction of weakly branches is especially useful to plants, whether greenhouse or half-hardy, that have been obtained from cuttings within the last two or three months, and whose tissue is yet so tender that they are exceedingly liable to be injured by moisture. Immature shoots on specimens of such a kind act as so many absorbents of water, attractors of disease, and conductors of it through the rest of the system. And since they are commonly placed in pits, where there are no artificial means at hand of dissipating moisture, it is the more necessary to be careful that there shall not exist, in the plants themselves, a reservoir for the very element which is most likely to prove fatal to them.

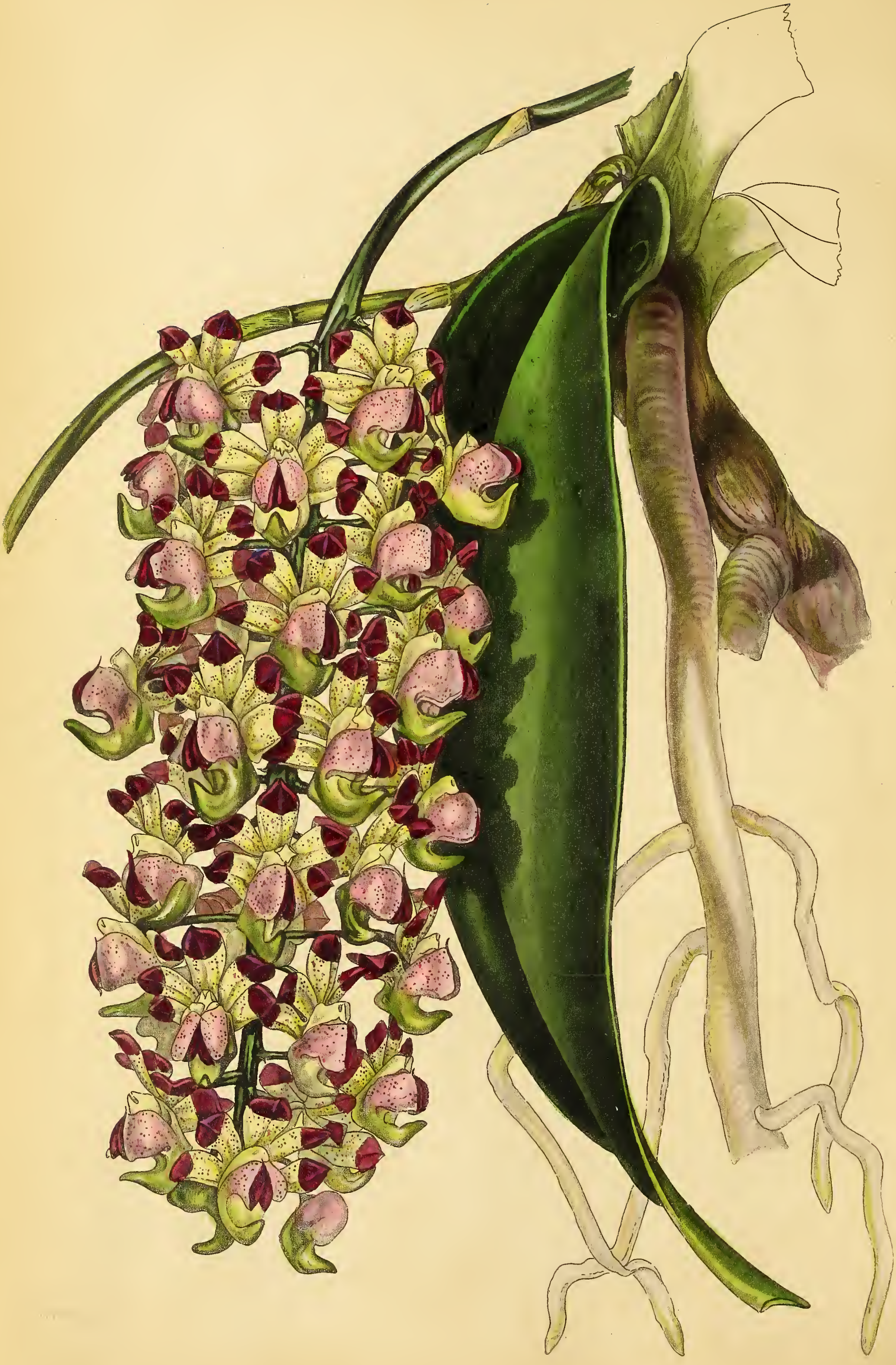
All pits and frames employed for the reception of tender plants ought to be somewhat elevated, to be surrounded with a dry material, and to have a dry wooden, stone, or slate pavement or shelf at the bottom on which to stand the pots. This pavement need not be thicker than is necessary for strength, and, if practicable, it should have a small dry chamber beneath it. Perforations should be made in its surface for the passage of whatever water is supplied to the plants; but no water ought to be administered until the plants are brought just to the verge of suffering from drought.

Straw hurdles should now be manufactured for covering frames and also houses in the depth of winter. An oblong frame, the shape of the lights to be protected, formed of waste strips of wood, and nailed roughly together, with two or three cross pieces to preserve its form, will, if filled up with long straw, fastened here and there to the outside, and to the cross bars, by tar-twine, do more to shelter a house or frame than any ordinary amount of fire-heat; and what is better, the plants will not be enfeebled thereby, as they would be by being placed in a temperature obtained by a fire apparatus. The covering must, however, be raised on bars of wood, attached to the roof so as to stand an inch above the glass, stopping up the openings which may be left round the edges with loose hay or straw. If in a dry state, deciduous plants, and others that are not particularly succulent, may be thus covered for weeks without detriment, but they must always be opened and exposed to the air, when it is neither wet nor frosty.

Tender shrubs that will not endure our winters will most likely have to be protected this month. Where old tarpawling can be procured, or where thick canvas can be tarred with facility so as to dry through before it is wanted, it will be preferable to matting for wrapping round delicate plants. Stakes should be placed to support it in such a manner that it nowhere touches the plant it is designed to protect; and it will then act as a preservative from both wet and cold, the former of these being often more dangerous than the first, and always heightening its effects. The same material will be further serviceable in covering frames or skeleton pits that have no glazed lights to exclude the rain.

Greenhouses, though they are not to be opened in wet or foggy weather, should be liberally ventilated whenever there is a gentle drying wind, which will be of more use than the application of fires in expelling moisture. Should the atmosphere become very damp, however, an occasional employment of the fires will be indispensable. In dry frosty weather, when the air in the middle of the day rises above freezing point, let the greenhouse be ventilated till the temperature again falls; for a circulation of dry air, when it does not absolutely freeze, is of immense benefit. Many Heaths, and plants of similar habits, will bear two or three degrees of frost with impunity, if the sun is not allowed to shine upon them ere they have thawed.

Keep the stove and Orchidaceous house at a low rather than a very high temperature, reserving a pit with a more genial atmosphere for the growing kinds. Where forcing is begun, the plants may be started with a heat of 50°, which can be gradually raised as the growth advances. Introduce fresh plants to the forcing-house for succession, and keep a supply in a cold pit to be moved to a higher temperature as they may be required. Plant bulbs in the flower-beds or borders, and pot such as have not yet been attended to. Manure and dig over the beds that have been divested of half-hardy plants. Still sow a few annual seeds in pots, and attend carefully, as to potting and watering, to the young plants raised from previous sowings. Be prepared, both in the houses and the open ground, for the occurrence of frost in the early part of the morning, which is sometimes now experienced when there is not the least sign of it at night.



AÉRIDES QUINQUEVÚLNERUM.

(FIVE-SPOTTED FLOWERED AIR-PLANT.)

CLASS.	ORDER.
GYNANDRIA.	MONANDRIA.

NATURAL ORDER.

ORCHIDÀCEÆ.

Generic Character.—*Perianth* spreading or closed. *Sepals* lateral, often oblique at the base, having a claw connate with the column. *Labellum* with a claw jointed to the column, saccate or spurred, three-lobed: lateral lobes short; middle one cucullate, or awl-shaped, or shortly tumid, or partially arched. *Column* reclining on the ovary, short, winged. *Anthers* two-celled. *Pollen-masses* two, furrowed at the back; caudicula broad or filiform; gland peltate, subrotund.

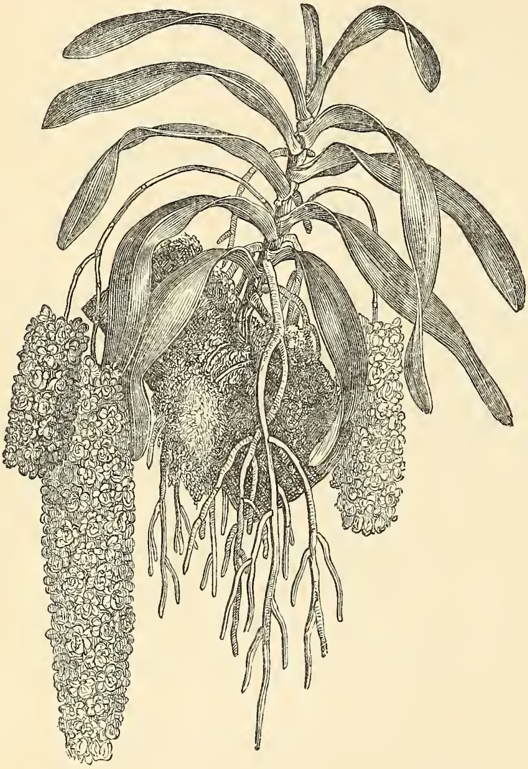
Specific Character.—*Plant* epiphytal. *Leaves* strap-shaped, rounded and obliquely emarginate, with a little projecting point, at the top. *Racemes* pendulous, many-flowered, longer than the leaves. *Sepals* and *Petals* thick, fleshy, whitish, speckled near the base, with a purplish stain at the extremities. *Labellum* funnel-shaped; lateral lobes erect, intermediate one oblong, inflexed, toothed; spur conical, incurved, green.

Of the genus *Aerides* few species are at present known in this country, although it is said to comprise no less than twenty-six distinct kinds. Most of these, Dr. Lindley observes, inhabit the eastern parts of Asia, and sixteen belong to Java; but very little information concerning the latter is possessed by British botanists.

The lovely *A. odoratum* (sometimes called *A. cornutum*, from the curved, horn-like spur attached to its flower) is an object of desire to every grower of Orchidaceæ, on account of the vigour of its habits, and the number, duration, delicate tints, and delightful odour of its blossoms. Specimens of this sort may be met with in most of the best collections. *A. affine* is a somewhat rarer, but scarcely less beautiful species, with longer racemes of smaller flowers, which are much blotched with pink.

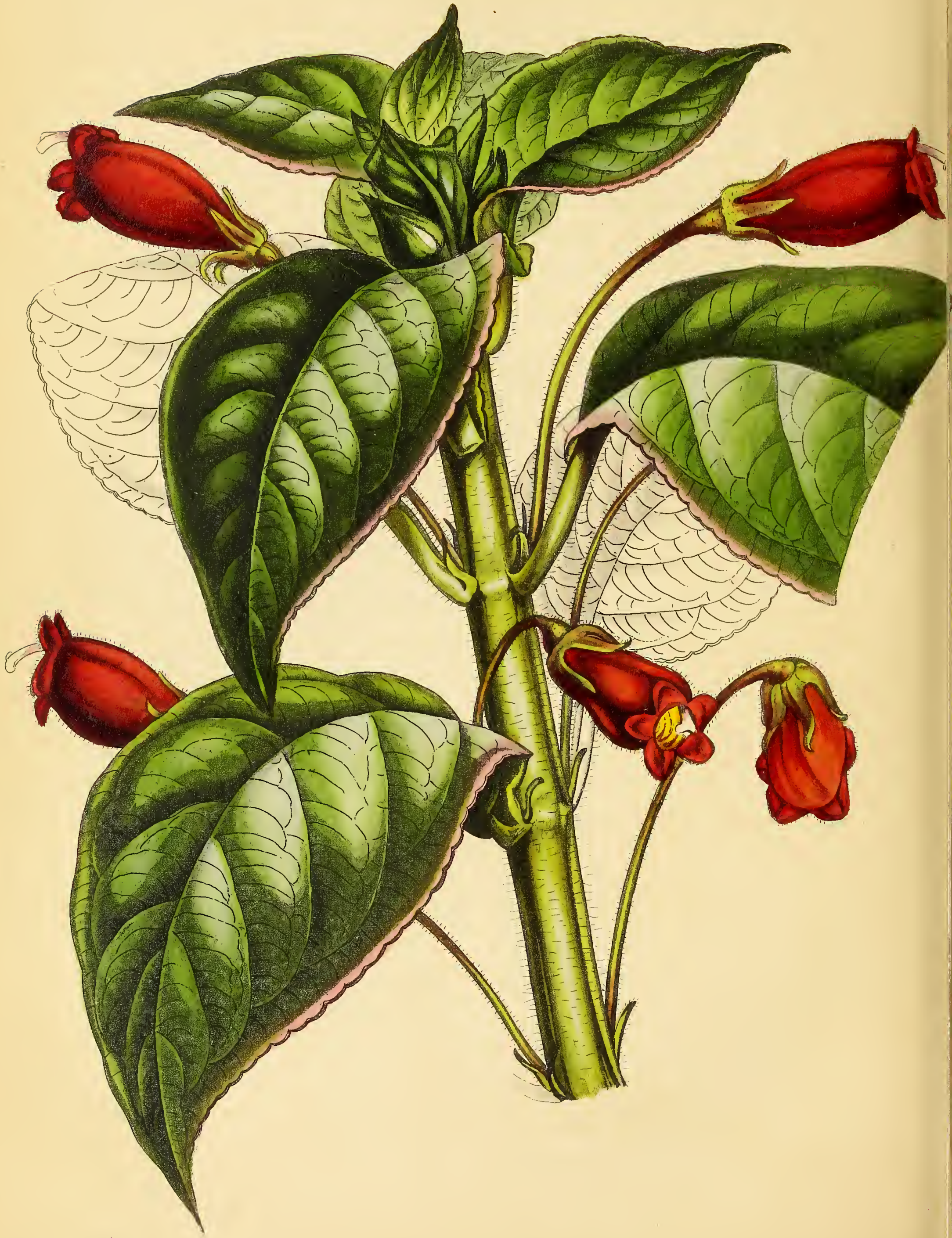
A. quinquevulnerum, which is still scarcer, has only yet been figured in the *Sertum Orchidaceum*, where it is remarked that " Mr. Hugh Cuming, who has been passing some time in the Philippines, and who has investigated the botany of those rich islands with zeal and industry, sent the plant to Messrs. Loddiges. It is one of the most showy of that beautiful race;" combining all the better features of *A. odoratum* with a superior variety and richness of colour. The sepals and petals are whitish, slightly speckled with purple, and having a rich purplish lilac stain at their apex. The spur of the lip is green; the two side lobes, pale pink, spotted with purple, and the middle one of a deep sanguineous crimson.

In the luxuriance of its growth, it is not all inferior to *A. odorata*, as will be seen in both the coloured plate and the lesser woodcut. It is likewise quite as prolific of flowers, the racemes being even longer; and the scent is peculiarly delicious. The great strength of the roots, and their branching nature, will help to explain why the genus has received the distinguishing name of Air-plant, since it is by the surface or spongioles of these organs that sustenance is derived from the atmosphere.



Messrs. Loddiges cultivate the species on a block of wood, hung from the roof of the house; and it is kept in a moist atmosphere, of a rather high temperature. It is not easily propagated, from the slowness with which it emits side branches; but when these are protruded, and have formed one or two roots, they can be safely detached, and are sure to succeed if appropriately treated. When plants of this class attain an unusual size, their appearance is improved by being planted in proportionate wooden baskets; for, if then growing on blocks of wood, they create the fear that the weight of their leaves and branches will overturn them.

Aerides is derived from *aër*, the air, as the plants subsist almost entirely on atmospheric supplies.



GESNÈRA MÓLLIS.

(DOWNY GESNERA.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMIA.

NATURAL ORDER.
GESNERÀCEÆ.

GENERIC CHARACTER.—*Calyx* adnate to the ovarium; limb nearly equally five-lobed, free. *Corolla* half-superior, tubular, with five gibbosities at the base; limb sub-bilabiate; upper lip drawn out, emarginately two-lobed; lower lip three-lobed. *Stamens* didynamous, with the rudiment of a fifth behind; anthers at first cohering into a round head. *Glands* five, or fewer, around the ovarium. *Capsule* dry in the calyx, one-celled, incompletely two-valved; placentas two, parietal, many-seeded. *Seeds* scrobiform.—*Don's Gard. and Botany.*

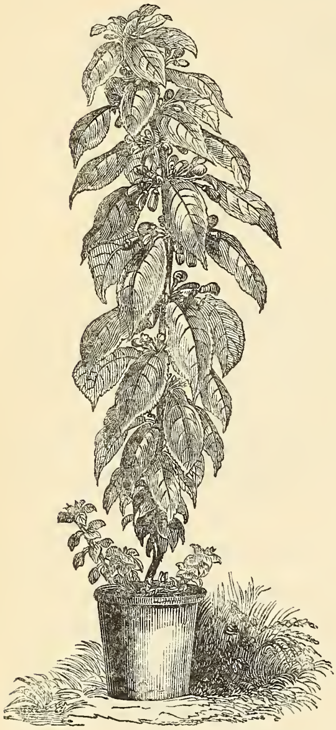
SPECIFIC CHARACTER. — *Plant* perennial, subshrubby. *Branches* hairy. *Leaves* opposite, obliquely ovate-oblong, acuminate, freely toothed, densely covered with downy hair above, whitish with down beneath. *Peduncles* axillary, usually one or three-flowered. *Corolla* tubular, inflated, pubescent; limb five-cleft, almost equal, spotted.

THERE are several groups of species in the genus *Gesnera*, each clearly separable from the rest by their peculiar character, but most of them composed of sorts that very much resemble each other in some of their features. Thus, the members of that tribe with irregular flowers, such as *G. bulbosa*, *Cooperi*, *faucialis*, *Sellowi*, &c., can hardly be recognised by their blossoms, or foliage, or tubers, when these are viewed apart from their connexion with the other organs. Hence, in noticing a new species, it is important to point out in what respects it differs from its congeners, and how it may be immediately recognised.

The peculiarities of the species here figured are the soft down with which its leaves and stems are clothed, and which at once yields to the touch of the fingers, and feels smooth and agreeable. This has furnished a clue to its specific name. The next observable point is the great height to which its stems attain under favourable culture without conspicuously branching, or, at least, without producing very prominent lateral shoots. Four and five feet are ordinarily reached, and it would probably even exceed this. In the flowers, it approaches very near to

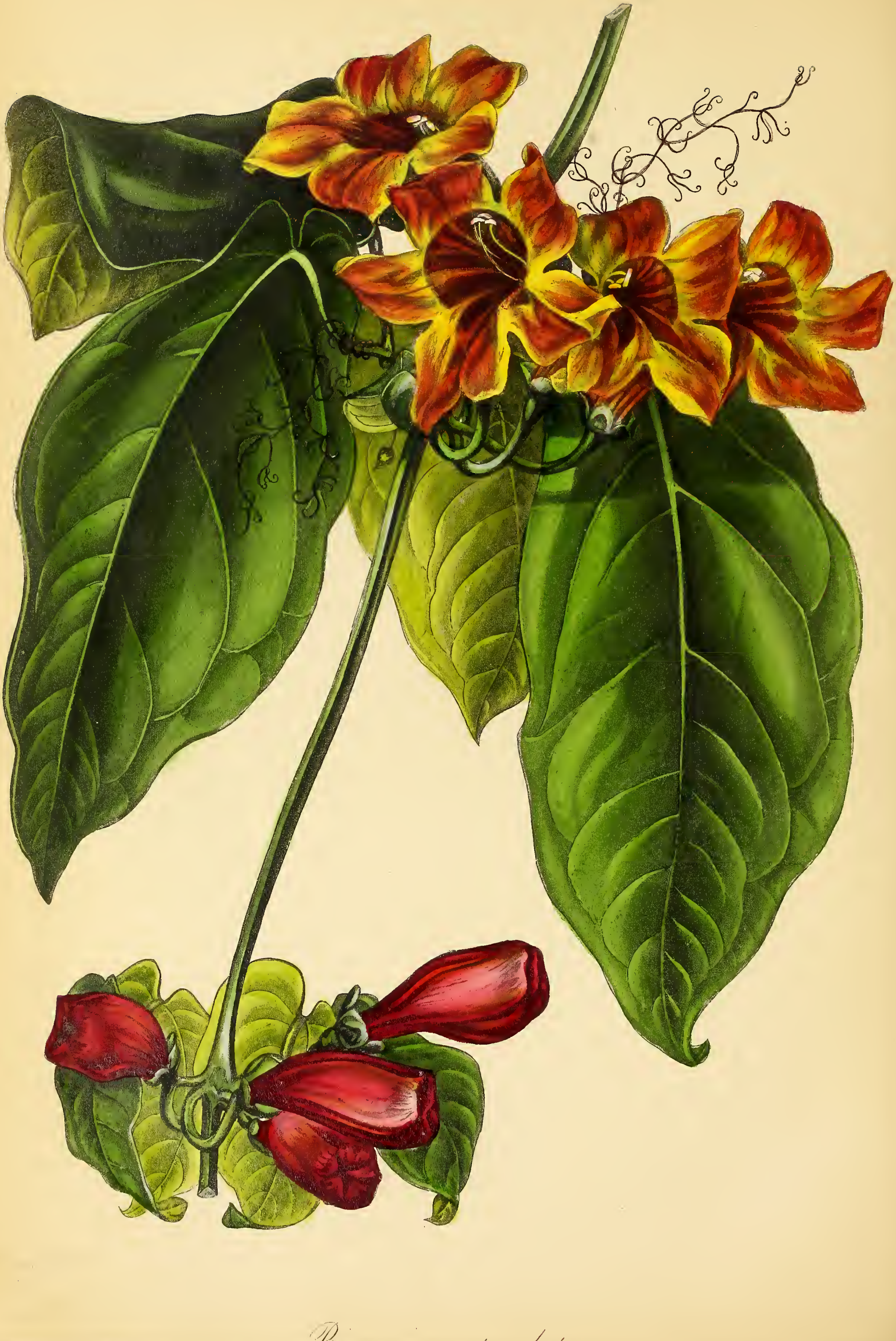
G. oblongata, (or *elongata,*) a species from which it is at once distinguished by its less shrubby habit, strong, erect, tall, succulent stems, and large soft leaves; while the blossoms, though similar in form, colour, and internal spotting, are a little more inflated in comparison with their length, and are produced in threes from the axils of the leaves on long and graceful peduncles. Those of *G. oblongata* are borne in clusters of four.

Altogether it is a very handsome plant, a native of the Caraccas, whence it was introduced to this country in 1839. It has been kept in a stove by many cultivators, but appears to thrive exceedingly well through the summer in a greenhouse at Mrs. Lawrence's, Ealing Park, from which collection we were favoured with our figure in the autumn of 1840. Indeed, with regard to the temperature it requires, the specimen we have just referred to was the strongest and finest we have anywhere witnessed, flowering during the whole of the summer, and far into the autumn. Its aspect will be better shown by the woodcut given below.



It demands no unusual cultivation. A rich soil in a moderately large pot, with comparative dryness in winter, and an abundant supply of water while growing, are its chief requisites. Perhaps, too, it will be benefited by a little stove-heat in early spring, and a gradual removal to the greenhouse towards the end of May or the commencement of June. It is increased by cuttings or suckers.

Linnæus dedicated the genus to Conrad Gesner, a noted botanist of Zurich.



Bignonia capreolata.

BIGNÒNIA CAPREOLÀTA.

(TENDRILLED TRUMPET-FLOWER.)

CLASS. DIDYNAMIA. ORDER. ANGIOSPERMIA.

NATURAL ORDER. BIGNONIÀCEÆ.

GENERIC CHARACTER.—*Calyx* campanulate, five-toothed, rarely entire. *Corolla* with a short tube, a campanulate throat, and a five-lobed, bilabiate limb. *Stamens* four, didynamous, with the rudiment of a fifth. *Lobes of anthers* divaricate. *Stigma* bilamellate. *Capsule* silique-formed, two-celled; having the dissepiment parallel with the valves; seeds disposed in two rows, imbricate, transverse, with membranous wings.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* a shrub. *Stems* climbing. *Leaves* conjugate; leaflets cordately-oblong, lower ones simple. *Tendrils* small, three-parted. *Peduncles* axillary, one-flowered, numerous. *Calyx* entire. *Corolla* reddish yellow.

AMONG the various species of climbing plants, there are not a few which, by inappropriate management, or by being placed in uncongenial circumstances, are rendered nearly useless for the purposes of ornament; and since the entire number of plants possessing a climbing habit is insufficient for the wants of the cultivator, and might be augmented with great advantage, it becomes a matter of considerable interest to bring those which are really valuable into a proper condition.

The beautiful climber of which we now present a figure is of the class to which we have just alluded. Being regarded as a hardy species, (and, to some extent, very correctly so,) as well as treated in the manner usually adopted for cultivating plants of that description, it is, when so tended, never brought to a free flowering state, and is consequently thrown out of most gardens as a worthless incumbrance, or merely allowed a place on a wall that is wished to be hidden, and where flowers are little desired.

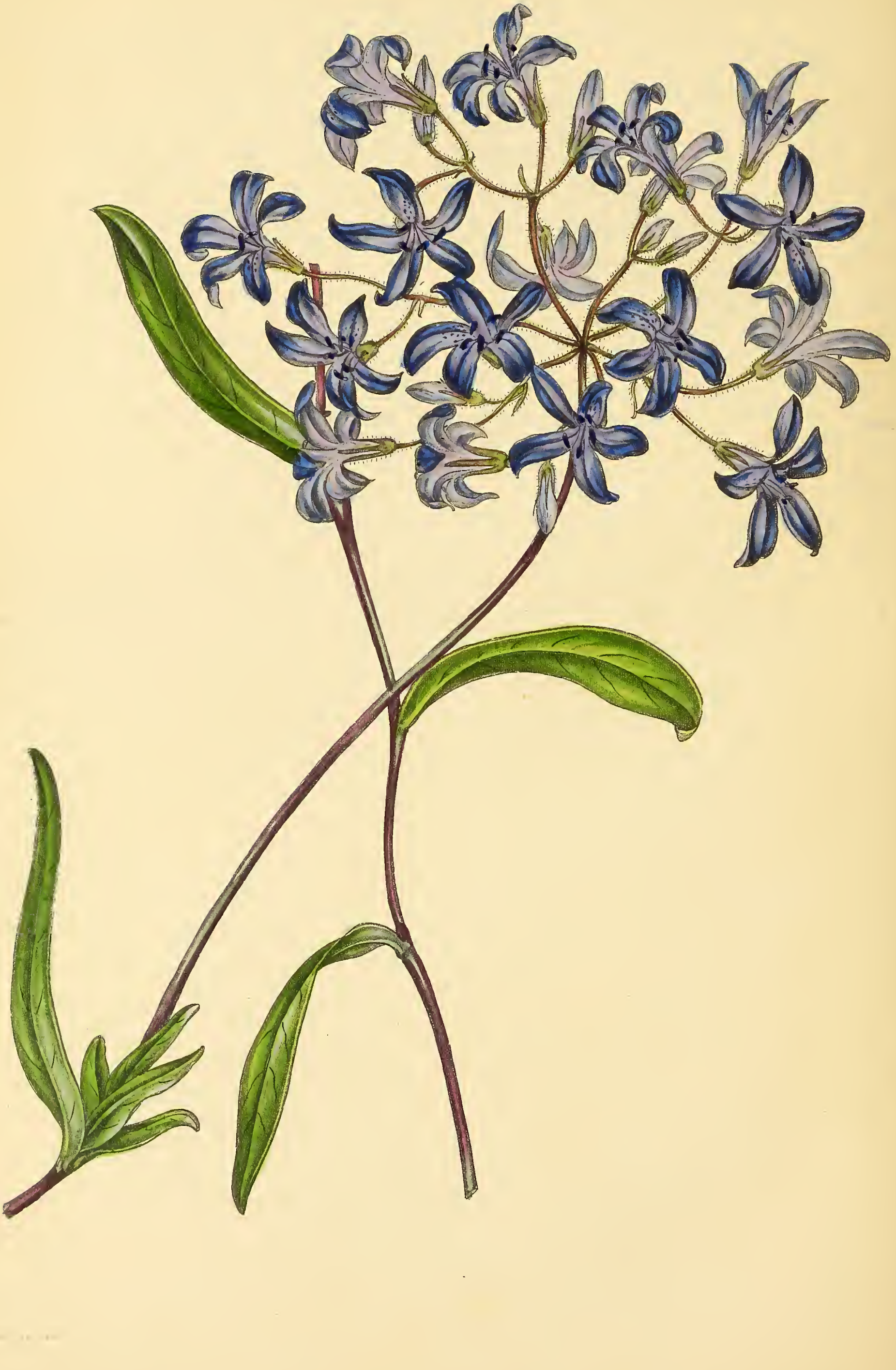
We happened lately to meet with it in the collection of W. Leaf, Esq., Streatham, where it is grown as a conservatory climber, and where the gardener, Mr. Dodemeade, by refraining from the use of the pruning-knife, and permitting the long flexible branches to hang down gracefully from the sides and roof of the house, succeeds in blooming it to perfection throughout the months of June and July. At the former of these periods, in the present year, our drawing was kindly allowed to be taken from the place already named.

The error which we have pointed out in the culture of this plant, when grown in the open air, is the shortening of the shoots after the specimen has attained a flowering age. By such means, it is always kept growing, and producing a quantity of vigorous but infertile lateral branches; whereas, by leaving the shoots to depend naturally from the principal stems, superabundant development is avoided, and the production of blossoms follows.

To grow the species, however, in the beauty which we have above noticed, and to which it is capable of being brought, we should decidedly prefer keeping it in a greenhouse or conservatory, in which it could be planted out in an open bed or border and trained up the rafters of the roof. From the latter, the pendent branches, profusely covered with their gay blossoms, would create a very delightful effect.

In regard to soil, one that is neither rich nor sterile will be most suitable. A compost of sandy loam and heath-mould will best answer the end; and, perhaps, the addition of a small quantity of sand will be useful. Cuttings taken from the points of the extreme branches of flowering specimens will produce blooming plants sooner than those obtained from specimens in an earlier or more rampant stage.

The genus is named in compliment to the Abbé Bignon, librarian to Louis XIV. The species derives its designation from the tendrils which accompany the leaves. It is a native of the southern parts of North America.



Marianthus cœruleo-punctatus.

MARIÁNTHUS CŒRÙLEO-PUNCTÀTUS.

(BLUE SPOTTED-FLOWERED MARIANTHUS.)

CLASS.	ORDER.
PENTANDRIA.	MONOGYNIA.

NATURAL ORDER.
PITTOSPORÀCEÆ.

Generic Character.—*Calyx* small, five-parted, lobes equal. *Petals* five, equal, linear-spatulate, connivent at the base, campanulately spreading at the summit. *Stamens* five, hypogynous, ascending; *Anthers* ovate, obtuse, dehiscing longitudinally. *Ovary* declinate, oblong, compressed, two-celled. *Style* filiform, subfalcate, continuous with the ovary; stigma capitate.

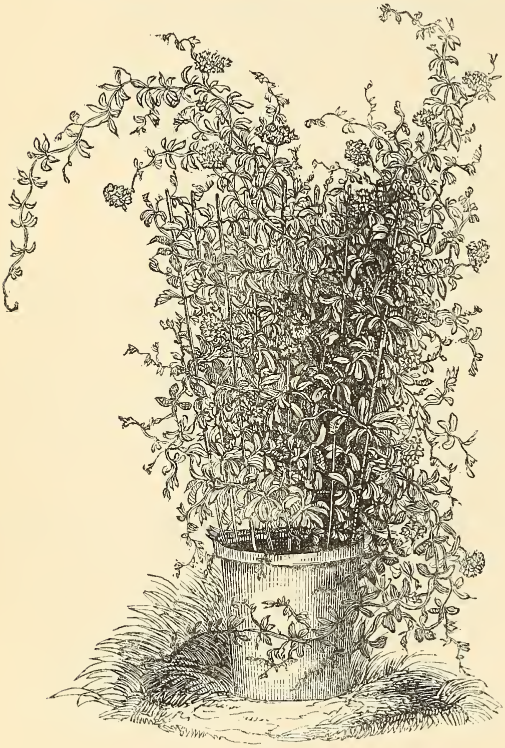
Specific Character.—*Plant* a climbing shrub. *Branches* pubescent, slender, twining to a great length. *Leaves* shortly petiolate, slightly villous; inferior ones spatulate, shortest, acute, toothed, or a little pinnate; upper ones oblong, acute, entire. *Peduncles* solitary, opposite the leaf, umbellate-cymose, many-flowered. *Flowers* pale blue. *Calyx* with five hairy segments. *Corolla* with oblong acute petals, the middle of which is spotted. *Anthers* blue.

Of the numberless plants lately introduced to this country from the different British settlements in the Pacific Ocean, comparatively few are of a climbing habit, and still fewer of these deserve perpetuation. The very elegant plant now figured forms, however, a decided exception to that statement, and ranks among the most beautiful and interesting of its tribe. Without bearing large or particularly showy flowers, it produces such prodigious quantities of them, and they are so gracefully disposed, as well as of such a pretty colour, that it will, we are certain, recommend itself to lasting favour.

In the Botanical Magazine for September, where it is depicted partly from dried specimens, and partly from plants which bloomed feebly in the stove of Mr. Cunningham's nursery, Comely Bank, Edinburgh, it is presumed that these were the first to flower in Britain. It afterwards blossomed in a greenhouse at the Royal Botanic Garden, Edinburgh.

At Messrs. Henderson's nursery, Pine-Apple Place, whence the present drawing was taken in July last, we met with it in very profuse flower during the summer of 1840, and it was treated as an ordinary greenhouse climber, except that it was kept in a pot, and trained to a circular or balloon-shaped wire trellis. These gentlemen received the seeds from a friend, who procured them from Swan River. The Edinburgh specimens were obtained from Mr. Low, of Clapton, who raised it in 1839, from seeds collected in the Swan River colony by Mr. Wm. Morrison, and marked "*Sollya* or *Billardiera* sp., from the Darling range of mountains."

It is a most charming little plant, with slender branches, which extend to an amazing length, and protrude considerable quantities of their pleasing blue flowers. Wholly unfit for training to the rafters of a house, or along any flat continuous surface, on account of the tenuity of its branches, and the distance of its leaves, it should always be attached to a trellis such as that already mentioned, and the stems should be arranged pretty close round it in a spiral direction. Treated thus, its fine clusters of flowers stand out from the trellis at Messrs. Hendersons', and produce a most delightful effect during the months of May, June, and July.



The compost employed is a common mixture of heath-mould, loam, and sand, well drained, and carefully watered. Cuttings of the younger shoots appear to root freely.

It is not known from what the term Marianthus is derived. Dr. Graham suggests that it is dedicated to the Virgin Mary, "on account of the pure whiteness of the blossoms of the first-discovered species." The engraving given above will best illustrate its character.

OF GARDENING AS A SCIENCE.

NO. XI.—ELECTRICITY.

We have now arrived at the grand climax of our theory, at the main-spring of all the great natural agencies, and it is with pleasure we recur to those papers on electricity, a series of which is in progress in the Magazine of Domestic Economy.

When we consider the agency of the ethereal fluid upon vegetable vitality, it will soon appear that little or no reference will be made to the common experiments of the lecturer. Our object is to prove that every leading phenomenon of life and growth is dependent upon one great principle, derived from the Sun; and the solitary example we shall seek in machinery will be cited to prove that there is no such things as a *minus* condition of the electric fluid; and therefore that the term ought to be abandoned, as inexpressive of facts. Electricity is described to be "a subtile, impenetrable fluid, of prodigiously rapid motion and action, which pervades the substance of our planet, and, when in perfect equilibrium, is in a state of complete repose; therefore, when by any means its presence is evident on sealing-wax, amber, glass, or any other substance, the equilibrium of the electric mass is partially disturbed, and the energetic effects produced by this agent are always the result of an attempt to regain the state of equilibrium. The chemical operations of matter are nothing more than a disturbance of the electrical equilibrium. Not only the motion and change of inorganic matter, but the motion and life of organised matter; the nervous action of the organic or vegetative, and the animal or voluntary life in animated beings, are constantly producing such electrical excitement. Thus all the various actions and habitude of matter connected with the laws of dynamics, or motion in a partial and independent sense, and not with reference to the general motion of the mass—all decompositions and new combinations, all changes of condition, from the solid to the liquid, from the liquid to the gaseous, from this latter back again to the liquid, and so forth, are invariably and necessarily attended with a disturbance of the general electric repose."

This is exactly the point to which we have been labouring for years to bring the Electric Theory; and, now, a writer in a monthly periodical steps forward and boldly asserts what we have only suggested. But the gardener may inquire, "What have I to do with electric disturbances?" This may be fairly put, because nothing is seen or observed which can convince the eye; but when the mind contemplates the fact that every act of friction and percussion induces a chemical action, which, however slight it be, reveals a corresponding quantity of electricity, (as is manifested *to the eye* with hundreds of dry substances,) then the gardener will perceive that in every one of his operations by spade, fork, garden-trowel,—of mixing of soils, manures, composts, potting, re-dressing, or even stirring the surface of his pots,—he disturbs the condition of his ground, brings fresh matters and substances into contact, and thus promotes the decomposition of water, and of hydro-carbonous materials, and produces an equivalent stream of electricity, which conveys the nutritive, newly-formed fluids, into the absorbent vessels of the roots.

Dr. Faraday of the Royal Institution first instructed the world that definite quantities of electricity were required to decompose chemical bodies, and reveal corresponding quantities of the same fluid; whereby a *comparative standard* of effect, or a *positive measurer* of the subtile agent, may be established. In the course of experiments which are recited in the New *Researches* in *Electricity*, it was determined, " that the quantity of electricity which, being naturally associated with the particles of matter, gives them their combining power, is able, when thrown into a current, to separate those particles from their state of combination; or in other words, that the electricity which decomposes, and that which is evolved by the decomposition of, a certain quantity of matter, are alike." (Researches, 8vo edit. p. 256).

In *Horticulture*, when we apply this theory, every portion of soil contains decomposable substances, which contain the *elements of water* (oxygen and hydrogen) in the proportions to form water, united with a determinate quantity of *carbon* (the base of charcoal). These elements are held together by definite quantities of the electric principle, the source of which is the sun. In culture this electricity becomes disturbed, and the particles deranged; they change their position, and become re-united under various solid, liquid, and gaseous forms—all and each again combined with appropriate, equivalent proportions of the all-pervading ethereal fluid. Now though we may not be able to ascertain minutiæ, or even to acquire the credence of doubters, certain it is, so much *has* been elicited and demonstrated by experiment, that there can be no hesitation to challenge the whole world of antagonists to disprove it, or afford a rational ground for disbelief; and especially since the theory is perfectly consistent in itself, and offers a complete solution of every phenomenon. At present we are only emerging from a state of ignorance and darkness; but the light has dawned, luminous facts are revealed, and we are in the "royal road of scientific discovery."

Our writer of " *the Series*," page 66, says, " If according to Franklin's notion, the only distinction between these two kinds of electricity" (called the vitreous and resinous) " be the plus or the minus condition, it is singular that the negative or minus condition should possess distinct and determinate properties, differing from those of the plus; because the logical inference is, that the minor condition, being proportionately deprived of electricity, would display the *same precise character* as the electric body, but only in a less degree; or if the minus condition involved a complete deprivation of the electric principle, then it would display no electric properties at all. But it has been observed that each kind of electricity, like the two poles of a magnet, is repulsive of itself and attractive of the other."

We do not conceive that there is any position in science more conclusive than is the above; nor one which the candid scholar could less desire or attempt to impugn: it is that position to which allusion was made in the early lines of this article, and that we hope to substantiate by one easy experiment. If to the cushion or rubber of an electrical machine, a Leyden jar be attached by a small hook, in lieu of the chain which usually is suspended from it, and if another jar of the same capacity be applied to the extremity of the prime conductor, both jars will become equally charged by any given number of turns of the plate or cylinder. But according to the plus and minus theory, the jar at the cushion ought thus to become partially or fully exhausted; whereas, both are equally charged, but with electricity of opposite character, for the knob of one jar will attract *that* which the other repels; and thus if both jars be placed upon a chain or strip of metal, so as to connect their outer surfaces at bottom, the knobs being a foot or more distant, a jointed discharger applied to those knobs at the same moment, will cause the electricities of the two jars to unite with a report, strong in proportion to the charges of each jar. The experiment is conclusive, its phenomena cannot be denied or questioned.

Combustion, whether visible and energetic, or concealed and slowly progressive, as in the heating of a hayrick, and decomposing hotbed, are manifestly within the range of horticultural science; and here again we observe a masterly passage at page 68. The reader must be, however, prepared to recognise in combustion the strong attractive energy of the two elements of water, of *electrised* oxygen and hydrogen, or in other words, the combination of their bases with electricity. "Combustion is the result of chemical action arising from the electrical principle. Flame is nothing more than the burning of two gaseous bodies in the act of combining under electrical influence; and as solids burn by showing only a red or a white heat, according to the temperature which produces combustion, that is to say decomposition, attended by light as well as heat; gases, or rather gaseous explosive mixtures, whose elements meet gradually, burn by showing only what we call *flame*, because the gases themselves are invisible. The only element of combustion (or archeal element) that animals can respire and not die, is oxygen, which, in a diluted state, the diluent being nitrogen, constitutes the vital air of living and breathing creatures. It follows, therefore, that the agent or pabulum of all our domestic fires and lights is oxygen. All these fires and lights arise from the combustion caused by a mixture of oxygen and hydrogen in their effort, under electrical agency, to unite and form water. Thus the flame from coal, wood, paper, rag, oil, fat, wax, and candles of all descriptions, is nothing more than the formation of water. But all such fuel contains, besides hydrogen, the element carbon, which is of great use in giving light; for though the combustion of hydrogen, in the oxygen of the air gives out great heat, it affords very little light, and, therefore, it is to the vapour of carbon combined with it that we owe the bright flame of a coal or wood fire, or of a candle. Thus, simultaneously with the water, carbonic acid is formed."

The vapour of carbon alluded to is the separation of the carbon during the act of electrical disturbance, whereby a portion of the liberated electricity combines with the solid carbon, and separates its atoms, reducing them to a state of infinitely minute division: all vapour is an electrical division of particles, and chemical phenomena depend upon the play of their electric equivalent affinities. We may wind up our articles, appropriately, perhaps, by extracting a passage or two from an essay which we penned some years since on vegetable electrisation by solar influence.

"The Sun is a body or vehicle of luminous matter, containing in itself the elements or principles of light, magnetism, electricity, and heat. These elements reach the earth in rays or beams, which furnish direct evidence of being primarily composed of light and magnetism: they also contain *electrising* and *calorific* principles, which when brought into action in a suitable medium, produce and develop electricity and heat.

"The rays of the sun are also, under certain circumstances, refracted, reflected, and absorbed, but are never lost or extinguished; every particle being devoted and applied to the effectuation of a specific purpose. Among the chief and most important media of conduction and absorption are vegetable *organized beings*—trees, shrubs, and herbs of all descriptions; and by this process of absorption the most beautiful phenomena are operated.

"Plants abound in pointed terminations, and contain a vascular system, composed of vessels and cells abounding with juices, which qualify them to become the recipients, and most ready and perfect conductors of electricity in any of its specific modifications." The solar rays thus absorbed during their passage through the vegetable organs, operate chemically; they disturb the electricity of the various combinations of oxygen, hydrogen and carbon, and produce specific fluids—gums, resins, salts. The woody fibre is also formed, deposited, and solidified.

"Each individual process is performed by specific means, each particle of the rays is devoted to specific purposes. *Magnetism* must not be overlooked, for it is identical with, or a modification of, electricity! At all events, it evinces peculiar powers, which remind us of the 'plus and minus,' 'vitreous and resinous' qualities of the old electricians. Perhaps the day is not far remote when these two grand ethereal agents will be found to interpret the phenomena of positive and negative electricity!"

Thus then, every individual phenomenon in chemistry and vegetable structure, all combinations and decompositions, are effected by agencies or by organs adapted to the express purpose, and all in beautiful harmony, and in accordance with the purposes of Infinite Wisdom.

CULTURE OF A FEW ORNAMENTAL PLANTS.

In the attempts that are now made to gratify the desire of obtaining a variety of exotic plants for forming beds and masses in the pleasure-garden, it is singular and interesting to observe how plants of particular habits accommodate themselves to a difference in circumstances. Many climbers, whose disposition when supported is decidedly to ascend, will, if planted in groups and left untended, trail along the surface of the ground, intermingle their branches with each other, and compose an assemblage in all respects pleasing; thus taking the direction which those branches of climbing species that are not sufficiently near other and stronger objects usually follow in their natural state.

A good example of this fact is shown in *Thunbergia aurantiaca*, and several species and varieties of the same genus. *T. alata*, *alata alba*, a pale orange-flowered seedling with a light centre, and a pure white one with the figure of *T. alata*, (both which last are common in the London nurseries,) make beautiful beds from June till October in fine seasons. During very wet and dull summers, like the past one, they do not succeed so well, and have a starved appearance, which spoils their effect. But the ordinary warmth of a British climate is quite adequate to their development in a manner fully equal to that in which they are seen in a stove. Young plants may be easily raised from cuttings in the month of March or April, and kept in pots till the proper period for transplantation, merely shifting them a little if they require it, and not using any kind of stakes, but simply pinching off the ends of those shoots that are inclined to straggle. They should be placed at first in a warm greenhouse, and be inured during May to the temperature of a cold frame, from whence they can be at once transferred to the borders. It is advisable to expose them entirely by day, while in these frames, for a few weeks before they are planted; because, being of a tender nature, they would receive a severe check if too rapidly and abruptly shifted from a confined atmosphere.

Another plant well suited for a similar purpose is *Lophospermum scandens.* Why, however, its specific name should have been applied, when there are species which climb to the length of twelve or fifteen feet in one year, while most of the shoots of this plant creep along the earth, and the rest only rise a foot or eighteen inches, it is difficult to divine. The species has handsome flowers, not quite so large nor so expansive as those of *L. erubescens*, and of a darker and somewhat duller hue. Its tendency to trail renders it peculiarly well adapted for placing in borders, or for collecting into beds; and each plant will cover a space of from one to two feet in all directions, flowering most profusely. If the specimens in a group be situated about eighteen inches or two feet apart, they will grow into each other, and cover the soil with a showy carpet of foliage and flowers, which, while it is fully as dense as that produced by the more familiar forms, will be agreeably undulated from the greater elevation of the stems immediately above the roots. Protection must be afforded in the winter; and it will be best to destroy all the stock but four or six specimens, which should be taken up, reduced, potted carefully, and preserved in a greenhouse or frame till spring, when they can be extensively propagated, and the newly-raised plants again taken to the open ground.

L. erubescens, and all tender climbers that elevate their blossoms sufficiently to keep them above the soil, and to show them to advantage, might be treated in conformity to the same system. Only it must be remarked, that such strong-growing kinds are less likely to be available for the object, on account of the extent of surface they would cover without bearing a proportionate quantity of bloom. Close and frequent pruning alone would suffice to retain them within due bounds.

For novelty, and likewise to introduce a very pretty addition to the charms of a series of flower-plots, small trellises of wire or twine (the former being most appropriate, since it can easily be bent into a convex form) may be made over the more diminutive beds, and raised from three to six inches, with the view of preserving the plants from injury or disfigurement by having the dirt washed over them with violent rains, and, further, of placing them in a more conspicuous position. On these slight frames might be trained plants of the various species of *Tropæolum*, *Maurandya*, and the slender sorts of climbers, preparing them previously in pots on the identical trellises, or others of a like shape. Climbing plants so managed have the advantage, in addition to the freedom with which their roots can spread, of receiving the rays of the sun vertically. Both flowers and leaves are thus necessarily brought to the upper side, from which alone they are to be examined, so that the whole of their beauty is seen at a glance, and in one close mass, and is not scattered round a cylindrical or globular support, or placed on both or all sides of a flat or irregular trellis. The kinds of *Thunbergia* first mentioned can be managed in this way with the greatest success; a trifling elevation saving them from the damage accruing from heavy falls of water, which always deface flowers that are too near the earth.

The culturist may, with facility, work out the preceding hint in the treatment of low climbers of all descriptions that are grown in pots. By using a trellis whose outline is that of a greatly depressed semi-globe, with the convex side uppermost, and so tilted at the back as to bring the foremost edge below the rim of the pot, a method will be provided for concentrating the beauty of plants that do not bloom liberally, or for producing a superlatively fine show on those which are profuse flowerers, to which no other mode at present in vogue will bear any comparison. It is by no means necessary, however, that the trellis should be unequally poised; and if situated in such a manner as to stand all round on a common level, it will even be more symmetrical.

Considering the peculiar dwarfness of plants so trained, it will be perceived that their proximity to the glass, and freeness from anything that would interrupt their reception of light, are indispensable. It will, moreover be apparent that the plan is solely fit for the species of limited growth; and that these must be perseveringly deprived of shoots that would wander beyond a given circle, as well for the elicitation of short flowering shoots, as for the retention of the whole within a prescribed radius.

Such trellises may be affixed to a short, central rod, driven into the soil in the middle of the pot; or, as it is better to avoid thrusting stakes among the roots of plants, on account of the injury they sometimes occasion, the outer edge of the trellis can be brought below the top of the pot, and fastened, by strong wires, to a ring of similar strength surrounding the pot. *Kennedya prostrata*, *Zichya coccinea*, *Gompholobium polymorphum*, and several allied plants of the same genera, as well as many belonging to similar tribes which are not less frequently cultivated, constitute excellent subjects for training on the trellises here recommended.

GARDEN ARCHITECTURE.

Hitherto, houses with plain span-roofs have exclusively occupied our attention; but we must at length treat of what are styled curvilinear roofs of different kinds, whether as belonging to circular, oval, oblong, or undefinable structures, and as relates to an ordinary and simple curve, or one composed of larger and smaller arcs, popularly known as ridges and furrows, because the exterior presents a series of protruding and depressed curvatures.

Curvilinear roofs, till very recently, were almost uniformly made of iron, the bars for admitting the glass being throughout of the same thickness, with none of the stronger rafters which are requisite in a wooden erection. Hence, the advocates of wooden roofs—and the horticultural world has been long divided in opinion with respect to the greater eligibility of wood or metal for the construction of plant-houses—were compelled to adopt the old sloping or angular figure. Messrs. Loddiges' large palm stove may perhaps be considered the earliest example, on any noticeable scale, of the application of wood in a curved roof; though here the curve is much depressed, and its breadth is trifling when compared with the height.

Within the last few years, structures of the most extensive kind have been formed at Chatsworth, in which various and very prominent curves have been effected in the roofs with wood. These completely prove the easy practicability and strength of the plan; and their perfect success teaches, that those who prefer wooden roofs may now obtain this more elegant figure with the material of their choice.

The difficulty that has heretofore beset the builder in making *strong* curved rafters of solid wood, of any considerable length and size, has been the impossibility of warping them, and having them, concurrently, of an adequate power to resist a given pressure from without. This has been overcome by the employment of numerous long thin pieces of wood, cut to the required width, and, after being bent and attached to a frame of the proper curve, nailed and braced to each other till the desired thickness is attained. Rafters thus formed are found to be even stronger than solid ones.

Houses with a curvilinear exterior are superior to those having a plain slope, both in beauty of appearance and in their adaptation to the wants of vegetable life. Nothing need be advanced regarding their greater beauty, as it is universally conceded that a curved line is more elegant than a straight and angular one. And concerning the extent to which vegetation is benefited through their agency, a mere reference to the fact that, by presenting an increased variety and amount of surface, they catch more of the sun's rays, and so communicate a more copious supply of light to the plants beneath them, as well as for a lengthened period, will suffice to establish the position that they are in a high degree advantageous, since light is so important an agent in the growth of exotics.

For the same reasons, the division of a curved surface into ridges and furrows will be still more desirable, the transmission of light being yet further facilitated, and the reception of the direct rays being secured with greater certainty, when the sun's position and inclination are changed to the utmost extent, within a fixed distance from the horizon.

Objections, we are well aware, have been strenuously urged against what has obtained the name of the ridge-and-furrow roof system; but so far as these are at all worth consideration, they are nearly as forcible when directed against all sorts of curvilinear roofs. They resolve themselves, for the most part, into one which we have before generally combated—the extra expense caused by their erection. We might at once aver that this notion, applied to ridge-and-furrow roofs, classes itself among the false opinions on economy already exposed in a former paper, and therefore does not deserve to be dealt with individually. There are, nevertheless, a few points connected so peculiarly with this topic, that it may be well to elucidate them.

That a radical benefit accrues to the plants in cultivation under a roof of the class we are considering, is, we conceive, clearly demonstrable, and furnishes one argument in favour of expending a small additional sum in their construction. Another circumstance which gives them an advantage is, that they are not divided into moveable lights; but are, on the contrary, firmly and constantly fixed. No breakage of glass by shifting the lights, or gradual but positive injury of the framework, or liability to be carried off by sudden gusts of wind—all so inevitably incident to the common mode of construction—can occur in this case, and here a further reduction from the original outlay must be made. Again, the cross bars between the rafters can be cut far more slender, on account of their shortness, and the less weight they have to sustain. The fall of water, moreover, owing to the short slopes on the sides of the ridges, and the provision of proper gutters in the inferior rafters, is greatly hastened; and, even assuming that the long glass lately brought into use at Chatsworth (and which will occupy the entire distance between the ridge-and-furrow of a roof, without laps, thereby effectually obviating any leakage from the outside) is not employed, the amount of drip in the interior, when the laps are not puttied, or the putty is decayed, will be very considerably less than where the water has to run down a long slope of glass. Finally, by the employment of the glass just mentioned in a ridge-and-furrow roof, the house can be made quite air-tight; there will be a less escape of heat; the effects of severe cold winds will scarcely be experienced by the plants within; no natural agents, save extraordinary storms of hail, (and these will lose much of their power by the greater strength of a single piece of glass, and the obliquity of its surface,) can ever break the glass; the wood-work will not be shaken and cracked by shifting, and no kinds of apertures will be left, so that wet could be admitted and decay produced; nor will accidents occur through the unequal expansion of the lights in wet weather, which so often prevents them from sliding properly in flat-roofed houses, or from any other cause than mere carelessness.

We have entered thus partially into the merits of ridge-and-furrow roofs, because it must appear, from a due reflection on the circumstances alluded to, on others which every gardener will be able to see and appreciate, and on the really small extra sum which requires to be expended on them, that they are not the expensive and extravagant objects which some would represent them. It remains to state, that they are not suitable for houses of limited dimensions, or those which are not sufficiently long to admit of their being made of a considerable breadth without disproportion. A small structure ought to be quite plain in its outlines, that it may appear as large as possible; while it may be asserted as an equally fundamental rule, that a spacious conservatory should have variety in its roof, in order to avoid that monotony and massiveness which would otherwise be conspicuous. For a common span-roofed house, therefore, of moderate size, a plain sloping roof will be most appropriate. A larger building will be most aptly covered by a roof with a simple curve. And an edifice on a further enlarged scale may be most agreeably roofed by the combination of the curved and ridge-and-furrow plan.

Of the comparative suitability of iron and wood for the roofs of plant-houses, we shall not at present stop to inquire. Where the contour of the whole is circular, or of any figure inclining thereto, the different divisions being ranged round a central area, iron will be the fittest and most convenient material for enabling the builder easily and elegantly to lessen the distance between the bars at the top, and augment it towards the bottom. For every other figure, the two may be indifferently selected, as the taste, experience, or prejudices of the operator may dictate.

Circular buildings are so exceedingly attractive to the eye, and the accommodation they afford to the various plants, of peculiar habits, that come within the denomination of ornamental exotics, is so admirably congenial, that we are surprised not to have witnessed their adoption more frequently than we have yet done. Duly relieved by some architectural pile in the middle, they would constitute one of the greatest ornaments imaginable to the pleasure-grounds; and by their partition into compartments of any required length, each heated from the centre, and having a system of hot-water pipes independent of all the rest, and capable of being warmed or not at pleasure, the various tribes of plants might be arranged into groups in accordance with their appetencies, and every one of these might be allowed an aspect and a temperature such as it naturally delights in. Space precludes us from saying more on this occasion than that we have always entertained the belief that the only way to cultivate tender exotics to perfection is to separate them into classes as above hinted; and we know of no system by which this could be so well accomplished as that of erecting a circular range of houses for their reception.

For ventilating plant-houses different plans must be pursued in regard to the mode of their construction. A span-roofed house should have its side-lights hinged at the top, or fixed on pivots on each side of the middle, with a flat perforated piece of iron attached to the bottom, the perforations made at intervals of an inch to fit on a small iron rod in the lower part of the frame, in order to fasten the sashes open, and secure them when they are closed. By opening all or a portion of these on one or both sides of the house, according to the season, the state of the atmosphere, and the power of the wind, at the same time, in greenhouses, having a few of the upper lights capable of sliding, a kind and degree of ventilation may be obtained, which is exactly what could be desired for the inhabitants of the greenhouse. Of course, a less command of air will be necessary for the stove, though the same amount should be provided, with the exception of the movability of the superior lights, (which can be fixtures,) to be made use of at the discretion of the manager. In an orchidaceous-house, side-lights will be superfluous, and the ventilation may be effected by means of iron or wooden slides in the walls, beneath the outer stages.

Structures with curved and fixed roofs are differently ventilated. In these, the air should enter, through the medium of iron or wooden shutters, regulated as to size and number by the nature of the plants to be grown, and placed below the side stages. Similar shutters should be provided, at somewhat corresponding intervals, along the summit of the roof; it being of little moment whether this narrow surface is glazed or opaque, because the sun never shines in precisely a vertical manner, and if he did, this would be at a period when a slight obstruction to his rays would be rather useful. We may note, that the best principles of ventilation are involved in the process just sketched. Cool and heavy air entering at the base of a building, naturally drives the warmer and lighter air to the top of the roof; and as arrangements are here made for its escape, the most rapid and thorough circulation is effected. In the new conservatory erected at the gardens of the Horticultural Society, a cistern of water passes all round the inside of the house, immediately under the ventilators, thus both cooling the entering current, and charging it with moisture.

Every house of moderate dimensions should have one or more cisterns placed against the inner walls, and supplied by a pipe, communicating with spouts that pass round the lower part of the roof. Rain-water, which is the softest and the best for the cultivator's purposes, will then be nearly always at hand. The cisterns may be of stone, slate, stuccoed brick, wood lined with lead, or zinc, and they can be situated under the side stages. In stoves, the hot-water pipes should go through them, that the water they contain may ever be kept at a temperature warm enough for application to tender plants. We do not now intend to discuss any methods of heating.

To economize heat, an excellent plan is to make provision for some mode of covering the house with straw or other substances in frosty weather. It is astonishing what a quantity of fuel may be saved in this way; and we are sanguine in the hope that the time is not far distant when such a practice will be universal.

FLORICULTURAL NOTICES.

NEW OR RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR NOVEMBER.

Æònium cruéntum. The genus *Æonium* has been founded by Mr. Webb on the old *Sempervivum arboreum*, and is made to include several other species of *Sempervivum*. It is "characterized by having its seed-vessels partially sunk in the receptacle, and not regularly opening by the ventral suture, but only at the base and back by an irregular tearing." The present species is a succulent shrub, introduced by Mr. Webb from the Canaries to the nursery of Mr. Young, of Milford. It grows about a foot high in this country, has streaks of crimson on its leaves, and bears terminal panicles of star-like yellow blossoms. It should be kept warm and dry in the summer, and cool, with scarcely any water, during winter. It blooms in the month of May. *Bot. Reg.* 61.

Arctostáphylos nítida. With more of the appearance of an *Arbutus* than an *Arctostaphylos*, this is a very beautiful shrub, with erect branches, which are clothed with smooth, pale brown, shining bark in the older portions. The leaves are long, lanceolate, minutely toothed along the margins, and whitely glaucescent beneath. The flowers are produced in a copious kind of paniculated raceme, usually from between two branches, and are white, with crimson calyxes. The gracefully expanding character of the raceme constitutes a particularly fine feature. It was raised by J. T. Mackay, Esq., of the Dublin College Botanic Garden, from seeds obtained from Mexico five years back, and flowered in May last. Coming from the colder regions of Mexico, it is expected that it will be found quite hardy here. The protection of a frame will certainly be the utmost that is requisite. *Bot. Mag.* 3904.

Cyrtochìlum fílipes. In consequence of the principal colour of the flowers being yellow, this species "has the aspect of an *Oncidium*, from which genus it is distinguished by its labellum being narrowed to the base, where it forms an acute, not an obtuse, angle with the column. It has a very slender stem, about two feet long, perfectly simple, on the extreme point of which are four or five flowers about the size of those of *C. maculatum*," or somewhat smaller. The sepals and petals are blotched with brown. A lower temperature than is usually given to West Indian Orchidaceæ will suffice for this plant. Its native country is Guatemala. *Bot. Reg.* 59.

DIPLOLǼNA DAMPIÈRI. More curious than handsome; yet by no means without some attractions. It is an evergreen shrub from Swan River, something like a *Corræa* in habit and foliage. The flowers are clustered together into pendulous heads, having no definite calyx or corolla, but being surrounded by a series of small scales. Their chief peculiarity is the denseness of the long protruding stamens, which in the aggregate resemble a brush. They appear to be crimson towards the base, and to have crimson anthers. The outer or involucral scales are of a common green hue. It flowers in the early part of the summer, and is easily cultivated. *Bot. Reg.* 64.

ECHINOCÁCTUS CORYNÒDES. An interesting, low, globular, Cactaceous plant, which flowers abundantly in the Royal Botanic Garden during the summer months. It has nothing remarkable in its structure; it having generally about sixteen vertical furrows, and clusters of seven or nine aculei lodged in a woolly tuft in the crenatures of the ridges. The flowers are on the summit of the plant, numerous, bright yellow, and having a bunch of red stigmas in the centre, which give them a pleasing appearance. *Bot. Mag.* 3906.

E'RIA CONVALLARIOÌDES. One of the smallest species of the genus, with large many-nerved leaves, which sheath the stem, and from the axils of most of which spring the dense drooping racemes of flowers. The blossoms are white, without scent, and "much less pretty than was expected." It is an Indian plant, imported by Messrs. Loddiges, and J. Rogers, Esq., of Sevenoaks, with both of whom it has flowered. *Bot. Reg.* 62.

FRANCÍSCEA LATIFÒLIA. This seems to be a superb *Franciscea*, with large leaves and deep purple flowers, nearly twice the size of those of *F. uniflora*. It is a native of Tijuca, near Rio Janeiro, and seeds were sent by Mr. Tweedie from South Brazil to the Earl of Arran, by whom they were forwarded to the Glasnevin Botanic Garden, near Dublin, and there produced the plant which has since bloomed. Mr. Moore, of the Glasnevin Garden, writes, in October, "My large plant is in fine condition, and showing abundance of flowers, having from two to four together; and I do not despair of seeing from thirty to forty blossoms upon it at one time, during the ensuing month. I have kept it cool and rather dry in an airy greenhouse during the summer, finding it nearly deciduous and requiring a little rest. Shortly I shall remove it into a cool stove, where I cannot doubt it will flower freely." *Bot. Mag.* 3907.

HEÍMIA SALICIFÒLIA; *var.* GRANDIFLÒRA. Dr. Lindley considers this a superior variety of an old greenhouse plant which is not without beauty when well cultivated, but is quite uninteresting when badly grown. The variety was received at Syon House, the seat of his Grace the Duke of Northumberland, "from Captain Herbert, who obtained it on the Pampas of Buenos Ayres; and it flowered in June last." Its peculiarity is in the greater dimensions of its showy yellow flowers, and in the branches having a drooping habit. It is a greenhouse plant, but probably hardier than many inhabitants of the greenhouse. *Bot. Reg.* 60.

Kreysígia multiflòra. "A very pretty half-hardy herbaceous plant, with the habit of *Streptopus*, a native of the Illawara district in New South Wales, where it was discovered by the late Mr. Allan Cunningham, and introduced to the Royal Gardens at Kew in 1823. It bears its pleasing rose-coloured flowers in the summer months: they continue in perfection for some time, and are then succeeded by the somewhat pear-shaped fruits." Although the name is not given as a synonyme, we have no doubt this is the old *Schelhammera multiflora*, a plant that will thrive in the open border around London, and requires only a trifling shelter in any locality. It has very little beauty. *Bot. Mag.* 3905.

Lasiopétalum macrophýllum. An erect shrub, growing five feet in height and upwards, and having its branches, "especially the young twigs, closely covered with light-coloured tomentum, mixed with stellate rusty pubescence." The leaves are five to seven inches long, nearly three inches broad, ovate, green and hispid above, covered with white tomentum, mixed with rufous stellate pubescence below. The flowers are in corymbs, opposite the leaves, and have a large greenish white calyx, with a minute purple corolla. It was derived from "New South Wales' seeds, transmitted to the Botanic Garden, Edinburgh, in July 1835, by the late Mr. Richard Cunningham. It has been kept in the greenhouse, and flowered freely for the first time in May, 1841." *Bot. Mag.* 3908.

Prepùsa hookeriàna. A very elegant herbaceous perennial, collected by Mr. Gardner in Brazil, and sent to the Botanic Gardens at Kew and Glasgow. The leaves are crowded, narrow, and spatulate, and the flower-stem grows from a foot to eighteen inches high. The calyx is very much inflated, apparently crimson on the upper side, and green underneath. The corolla is pale purple. It flowers in March and April, but has not yet bloomed in Britain. Mr. Gardner has dedicated it to his friend and patron Sir W. J. Hooker, of whose kindness and talents it will form an excellent memorial. *Bot. Mag.* 3909.

NOTICES OF NEW OR INTERESTING PLANTS RECENTLY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Calánthe versícolor.—Most probably the same species which has been called *C. flavicans*, at Messrs. Rollisson's, of Tooting, and which is now flowering both in this nursery, and at Mr. Knight's, Chelsea. The leaves are of the usual strong description; but the flowers, although similarly elevated on rigid erect spikes to those of the common kinds, and having besides the ordinary white sepals and petals, possess a large and beautiful lip, which is at first blue, and gradually changes to a brownish or tawny colour.

CÁTTLEYA GUTTÀTA; *var.* RUSSELLIÀNA.—Inferior to the original species in the size of its flowers, as well as in the richness of their hues, but constituting a very interesting variety. It has peculiarly tall slender stems, and the sepals and petals, which are of a bright green ground, are spotted rather scantily and minutely with brownish purple. The lip is deep pinkish-purple, narrow, and somewhat truncated at the apex. It is blooming with Messrs. Rollisson.

CÁTTLEYA HARRISÒNIÆ; *var.* ÁLBA.—A most lovely variety of an exceedingly showy species; differing from that species in having its blossom throughout of a delicate whitish hue, slightly tinted with blush. The lip has also a dash of yellow towards the base. Messrs. Loddiges have recently flowered it in great beauty.

DICRÍPTA BÍCOLOR.—All the Dicriptas are remarkable for the Iris-like form of their leaves, these being opposite to each other, sheathing one another and the stem at the base, channelled on the inside, and narrowing away into pointed terminations. The present species is noticeable for the length, thickness, and vigour of its foliage, and for the greater dimensions and showiness of its flowers. The latter are solitary, raised on axillary peduncles, and of an intense orange colour, with a dark-brown lip. Plants have just blossomed in the orchidaceous-house of Messrs. Loddiges.

FÙCHSIA RÁDICANS.—Known in nurseries by the name of *F. affinis*, but more appropriately and primarily called *F. radicans* from the disposition of the branches to root at the joints, under favourable circumstances. It has somewhat climbing or trailing stems, singularly long discoloured leaves, and flowers which approach some of the older species; the calyx being crimson, and the corolla an intense bluish purple. It is a very handsome plant, and we have just seen it in flower at Messrs. Young's, of Epsom.

IPOMŒ̄A TYRIANTHÌNA.—The flowers of this superb plant, recently developed in a stove at Messrs. Henderson's, Pine-apple Place, are superior in colour to those of any heretofore introduced, and confirm our previous assertion that it is one of the most splendid of the tribe. The hue of the blossoms is of an indescribably brilliant reddish purple, comparable to nothing which we have ever met with, except, perhaps, the colouring matter, as exhibited without any preparation, in a newly-crushed cochineal insect.

MARIÁNTHUS— ? A pretty new species of *Marianthus*, of the same general habit as *M. cœruleo-punctatus* (figured at p. 247 of the present Number), but destitute of hairiness, and bearing flowers of a deeper blue tint, has flowered in a pit with Mr. Low, of Clapton. In another season, when the plant has been more fully developed, it will doubtless be as good an ornament to the greenhouse as its very interesting ally.

Niphœa oblónga.—This name has been applied to a valuable herbaceous plant, introduced by Mr. Hartweg to the gardens of the Horticultural Society, and there bloomed, in conjunction with the beautiful new *Achimenes*, during the whole of the autumn. It does not grow higher than from three to six inches, and throws out its elegant white flowers after the manner of a *Gloxinia*, in constant succession. It will be a great acquisition to our stoves.

Oncídium ornithorýnchum ; *var. O. ornithorynchum*—is one of the most charming species of the genus, and particularly useful for flowering in the months of November and December. Messrs. Rollisson are just flowering a pleasing variety, in which all the colours are very much darker than those of the original kind.

OPERATIONS FOR DECEMBER.

Pruning, manuring, digging, planting, and ground work of all the kinds included in the laying out or alteration of a garden, should be performed at the present season, where the duties of last month were so urgent as to prevent some of these being properly attended to. As the weather is generally very variable, it may be well to state what sort of days are most favourable for effecting the different operations.

During severe frosts, no description of tree or shrub ought to be pruned ; because, as the wounded part would thus be exposed to a greater degree of cold than it is capable of enduring, the tissue of that portion of the shoot where the cut occurs is usually killed. Unless, therefore, the branch be severed an inch or more above the bud, (which is a very objectionable plan, since it leaves the plant covered with unsightly and useless spurs,) the best part of it will be lost by pruning in frosty weather. Fine, open, sunshiny days are alike to be avoided for this process, for the powerful action of the sun causes an injurious discharge of sap from a wounded surface. Dull, cloudy, and cool weather is consequently preferable for pruning.

Planting, again, should be performed in similar weather, with the addition, if possible, of a damp atmosphere, that the roots may neither be subjected to frost, nor to the drying and exhausting agency of the sun or wind, which would further affect the leaves or branches if experienced immediately after planting in dry weather.

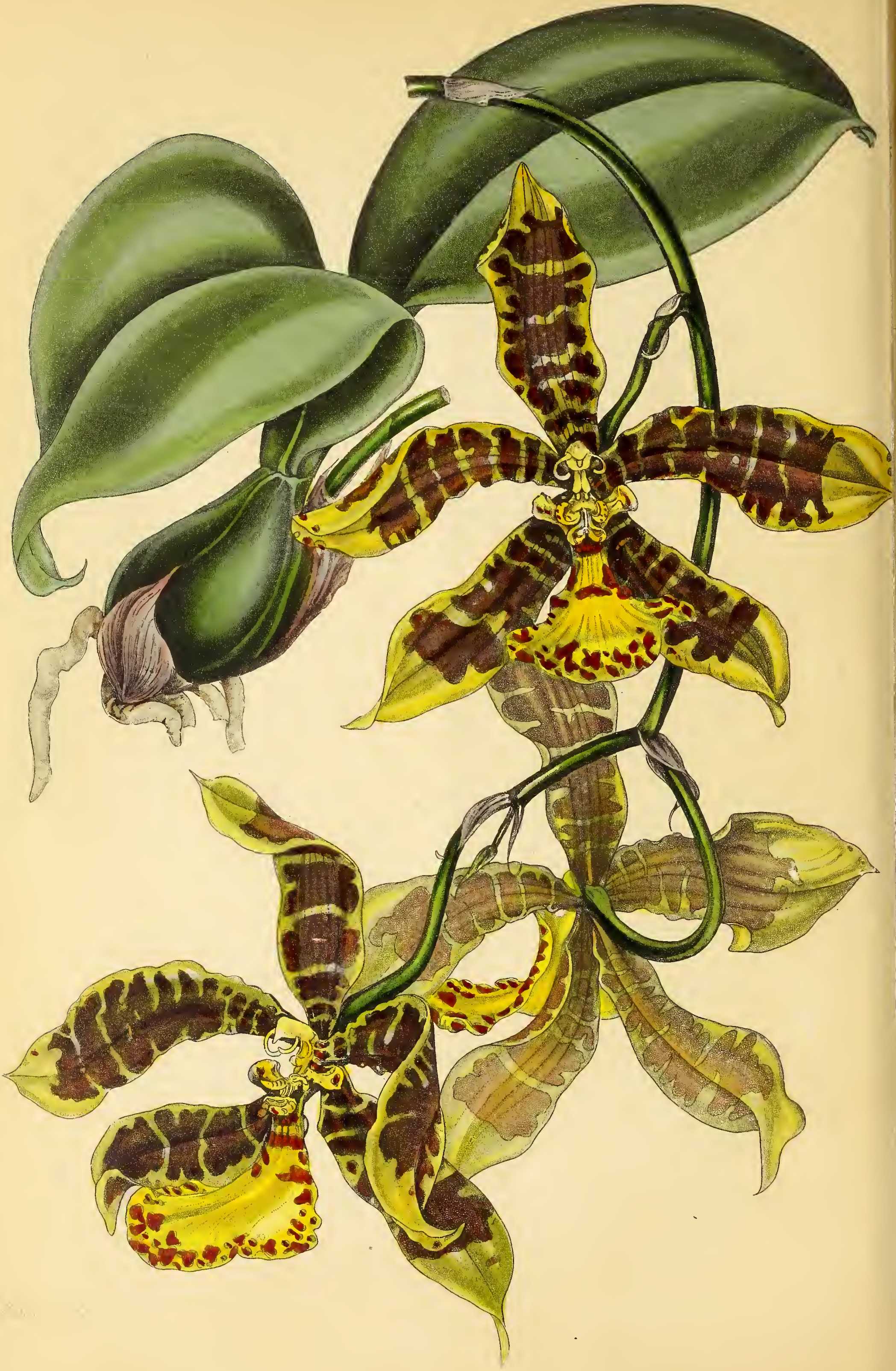
In digging flower-beds, and borders, and shrubberies, too, the mildest periods should be selected; for it is impossible to avoid hurting the plants or roots if the ground be much frozen. For turning over open plots, and vacant spaces of every kind, it matters not how rigorous the weather may be, provided it does not materially retard the workman or increase his labour.

The proper work to be done in sharp frosts is to apply manure, change the soil in situations where a new compost is required to be introduced, make excavations, elevate spots that are too low, drain wet land, and shift earth in any way or to any situation that may be desired. By following out such rules, it will commonly be found that there will be something fit to give occupation to the workmen, whatever may be the state of the weather.

Connected with the pruning of ornamental plants, we may observe that only those sorts demand the reduction of their shoots which, being great improvements on natural species or varieties, would grow too luxuriantly, and become infertile, if not so treated; and also the kinds which it is wished to retain in certain forms, or within prescribed limits. The pruning of the shoots alone will be of no service to such specimens as are growing in an extremely exuberant manner; and to give these a due check root-pruning must likewise be resorted to. The concurrent practising of the two modes will further only be beneficial when the extent to which the one is carried is regulated by that of the other, and when the roots are shortened as carefully and as systematically as the branches.

At the same time that a shrub is pruned, all worthless suckers should be as sedulously removed from its base as they are in the case of fruit-bushes; for nothing weakens a specimen, or destroys its symmetry and beauty to a greater extent, than a mass of vigorous suckers feeding upon and arising from its roots. There are likewise shrubs which require no pruning, from which the clearance of suckers is not less essential. After pruning, when the borders are dry, roses and other plants can be layered. Shoots of moderate strength should be chosen for this purpose, and they can be merely a little twisted, so as to crack them slightly in a longitudinal direction, or pierced with a small sharp knife, and then twisted at the point from whence, when placed in the ground, they will rise perpendicular. The weaker ones may be fastened down by laying a stone upon them, and the stronger by hooked wooden pegs.

The protection of tender plants, both in structures devoted to that end and in the open ground, is now a principal object of the gardener's skill. Although fires can never be altogether dispensed with, they will be rendered far less frequently necessary if straw or reed hurdles are placed on the roof of the house during cold winds or frosts; and pits and frames that are not supplied with a heating apparatus can be entirely and effectually sheltered by that means. Air should be given to every structure, including the dry stove, in clear mild weather, even though artificial heat should happen to be applied at the same time. Watering should be attended to on the finest days, and always in the morning.



Oncidium Insleayii.

ONCÍDIUM ÍNSLEAYII.

(MR. INSLEAY'S ONCIDIUM.)

CLASS.
GYNANDRIA.

ORDER.
MONANDRIA.

NATURAL ORDER.
ORCHIDÀCEÆ.

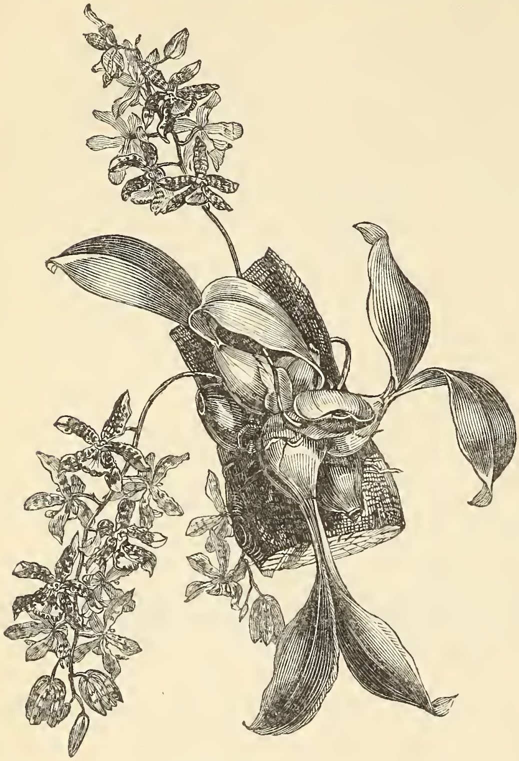
Generic Character.—*Perianth* showy. *Sepals* often undulated, lateral ones sometimes connate with the lower part of the labellum. *Petals* similar. *Labellum* largest, spurless, continuous with the column, variously lobed, tubercled or crested at the base. *Column* free, semicylindrical, winged at the top on both sides. *Anthers* usually two-celled; rostellum sometimes shortened, sometimes elongated and beaked. *Pollen-masses* two, furrowed behind; caudicula plain; gland oblong.

Specific Character.—*Plant* epiphytal. *Pseudo-bulbs* ovate, compressed, slightly furrowed, two-leaved. *Leaves* erect, thick, elliptically sword-shaped, partially undulated, recurved at the top. *Raceme* simple, erect, or partly drooping. *Sepals* and *petals* oblong, almost equal, undulated. *Labellum* obovate, retuse, arrow-shaped at the base, with depressed tubercles on both sides of the lower part, and a one-toothed plate in the middle. *Column* with slender curled wings.

The great number of species in the genus *Oncidium*, which have flowers only varying slightly in the combination of their brown and yellow tints, seems to render each acquisition in which the colours of the blossoms are in any degree similar, of comparatively small value. Such, however, is the extreme richness of hue in the flowers of the present beautiful plant, that, connected with their great size and pleasing arrangement, this property redeems them entirely from falling beneath notice, and places the species in the very first rank of orchidaceous plants.

It is a native of Oaxaca, in Mexico, whence it appears to have been introduced to this country by George Barker, Esq., of Birmingham;—this gentleman having succeeded in blooming it two or three years back, named it after his gardener, Mr. Insleay. Messrs. Loddiges also imported it from the same district, and it flowered in their nursery in the autumn of 1840, when the drawing now furnished was made.

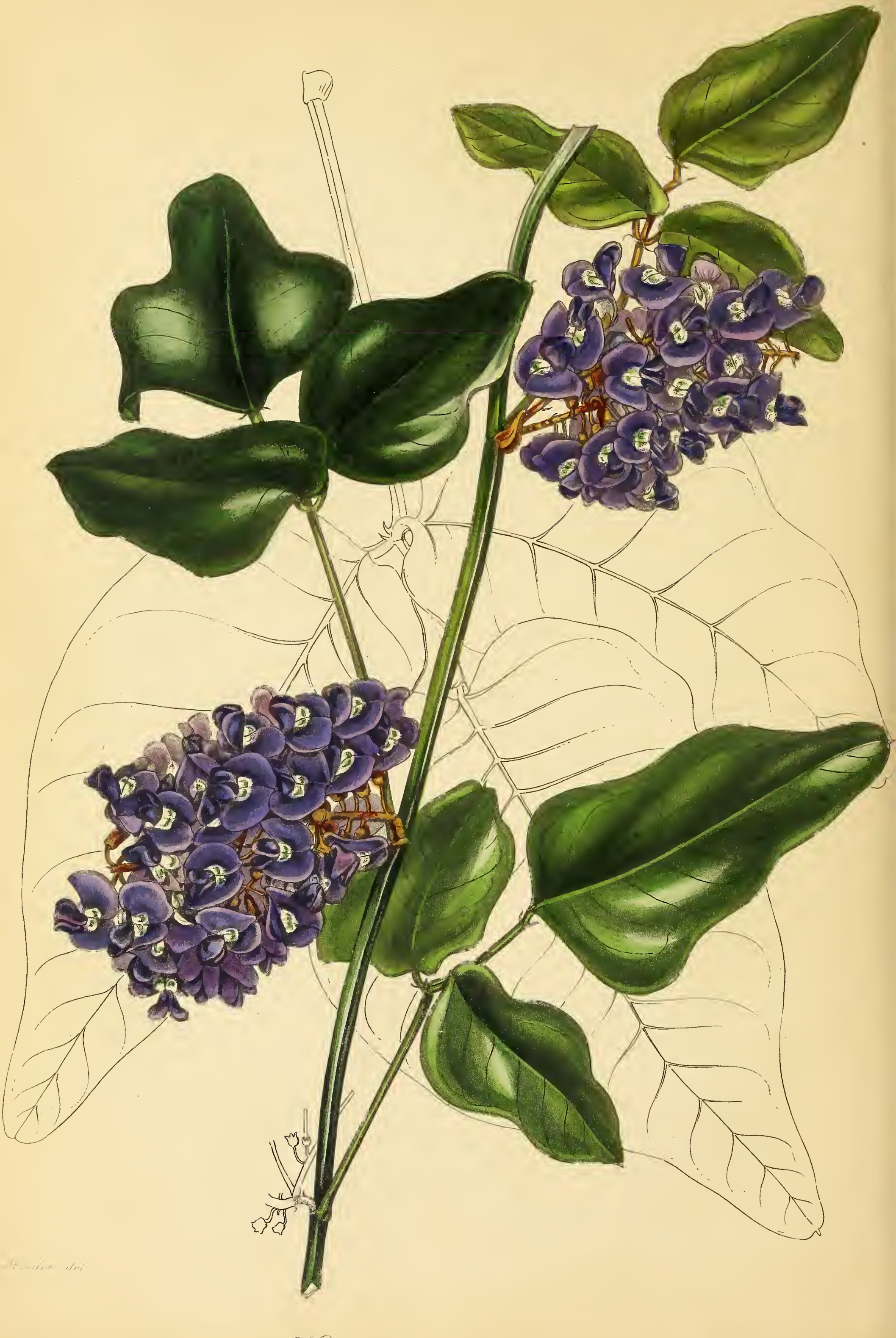
In the Miscellaneous Notices of the Botanical Register, Mr. Barker's plant is described as producing a rigid, erect raceme of flowers; but the specimen from which our drawing was taken bore a raceme of a decidedly half-drooping character, as partly shown in the figure, and better exhibited by the wood engraving. The flower-stalk will there be seen to issue in a graceful curve, and to depend in a very elegant flowing manner.



As we have remarked in a former number, the species was originally thought to be identical with *Odontoglossum grande*, on account of the partial resemblance of their pseudo-bulbs, but even in this particular a practised eye will easily detect a difference between the two plants, if both are in a perfect and fully developed state. The pseudo-bulbs of *O. grande* are larger and with a greater tendency to roundness; while those of *O. Insleayii* are more concave on one side, and with sharper edges. In the flowers, the latter plant is far inferior to *O. grande*, except in the colours of the labellum, where it has a manifest pre-eminence.

By a comparison of our excellent of the two species, (*O. grande* being figured at p. 49 of the present volume,) the chief distinctive features of the inflorescence will be at once manifest. The colours, the forms of the wings of the column, of the tubercles and appendages of the labellum, and of the latter organ itself, are essentially remote; and *O. Insleayii* comes much nearer to *O. papilio*, with which, again, it can never be confounded, from the striking peculiarities of each.

Messrs. Loddiges cultivate it on a block of wood, keeping it in the warm orchidaceous-house, during summer, and removing it to a cooler and drier place when its new pseudo-bulbs are perfected, which will be towards the month of November. Here it will most likely flower about February or March; at least, that is the period at which it blossomed with Mr. Barker.



Hardenbergia macrophylla.

HARDENBÉRGIA MACROPHÝLLA.

(BROAD-LEAVED HARDENBERGIA.)

CLASS.	ORDER.
DIADELPHIA.	DECANDRIA.

NATURAL ORDER.
LEGUMINÒSÆ.

Generic Character.—See p. 27 of the present Volume.

Specific Character.—*Plant* an evergreen climbing shrub. *Leaves* trifoliate; leaflets ovately-oblong, retuse, mucronulate, about the length of the petioles. *Stipules* setaceous. *Racemes* many-flowered, dense, half erect, or partially drooping. *Flowers* deep purple.

This most beautiful and valuable climbing shrub is one of the numerous interesting products of the Swan River Colony, the introduction of which to our gardens was effected by Sir James Stirling, who sent seeds to England in 1835. These were raised at the seat of Robert Mangles, Esq., Sunninghill, Berks, and probably at other places; we are indebted for our figure to Mr. Kyle, gardener to R. Barclay, Esq., Layton, Essex, with whom it flowered in May of the two last years.

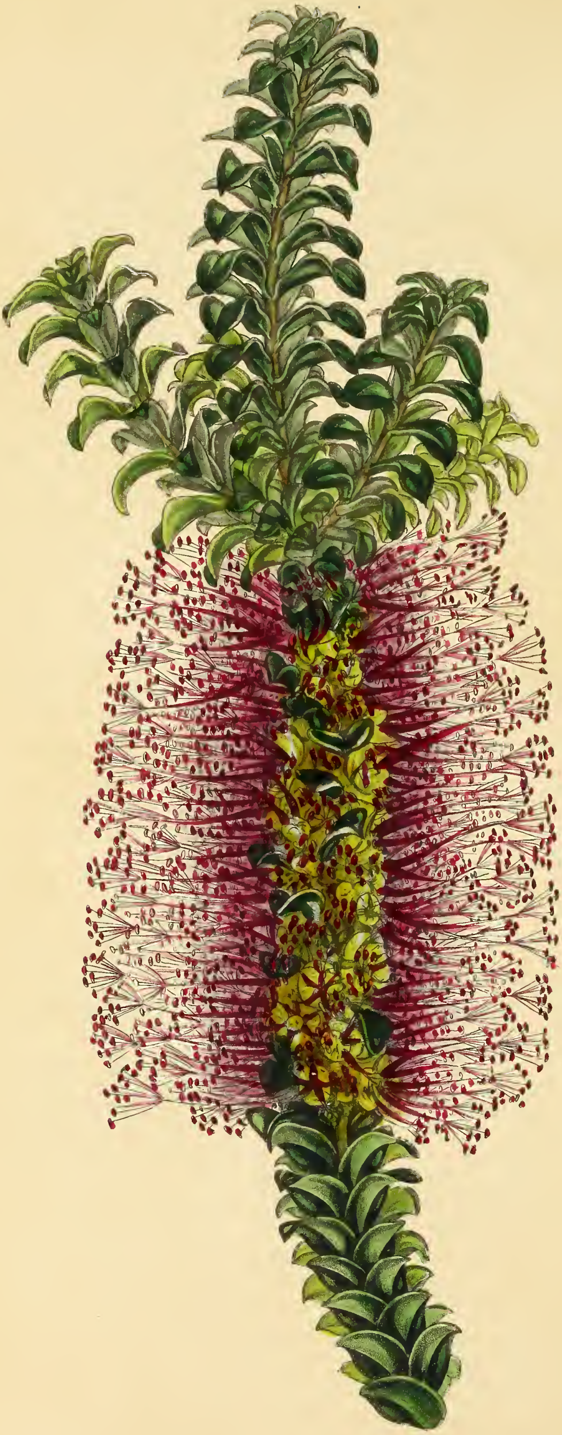
As to its affinities, Dr. Lindley states in the Botanical Register, that "it is in many respects so much like *Kennedya* (now *Hardenbergia*) *Comptoniana*, as to render it doubtful whether it is more than a variety of that species. It appeared, however, to differ in being altogether a more vigorous plant; its leaf-stalks were as long as the leaflets, and not shorter; the reticulations of the leaves were more coarse; and I did not remark any tendency to produce those linear leaflets which always accompany the original *K. Comptoniana.*" Other more general marks of distinction are the divided and branching nature of the racemes of flowers in this species, their shortness and partial erectness, the deeper hue and greater density of the blossoms, and the abbreviation and breadth of the leaves. All these points form strong grounds for considering the plant a separate species.

In habit it is a remarkably luxuriant plant, growing to a considerable height, branching widely, and being well covered with its handsome foliage. The racemes of flowers, too, are particularly abundant, and often diverge into three or four branches, thus forming a large cluster. Their colour is a brilliant purple, which does not fade by drying, as we have a specimen now before us the hue of the flowers on which is very nearly as rich as at the period when it was gathered.

Its culture, though assimilating for the most part to that of *H. Comptoniana*, should be varied in one important particular. The plant referred to seems to thrive and flower best when it is kept in a pot; but *H. macrophylla* is more suitable for planting in the border of a conservatory, where it can be allowed to cling to the pillars, or to chains or wires placed purposely for the support of climbers, and spread out its branches in all directions, without having them materially shortened. So managed, it constitutes a beautiful object, with the combined appearance of a shrub and a climbing plant. It may, nevertheless, be grown in a pot, and either trained in a similar way, or fastened to any kind of trellis of adequate dimensions. We must mention, however, that when its growth is stunted and contracted by confinement at the roots, it never exhibits that vigour and beauty which are common to it under more congenial and natural treatment.

The soil in which it flourishes best is a fresh light loam, to which about a third as much heath-mould and sand is added, and the whole well reduced and incorporated, but not divested of its fibrous or decayed vegetable matter by sifting. It flowers in the principal summer months.

Cuttings, ordinarily treated, root with the usual facility; and, as it produces seeds abundantly, it may be extensively propagated by them.



Beaufortia decussata.

BEAUFÓRTIA DECUSSÀTA.

(DECUSSATED-LEAVED BEAUFORTIA.)

CLASS.	ORDER.
POLYADELPHIA.	POLYANDRIA.

NATURAL ORDER.

MYRTÀCEÆ.

GENERIC CHARACTER.—*Tube of calyx* turbinate; limb five-parted; lobes acute. *Petals* five. *Bundles of stamens* five, opposite the petals. *Anthers* inserted by the base, bifid at the apex; lobes deciduous. *Style* filiform. *Capsule* corticate, incrusted to the tube of the calyx, three-celled; cells one-seeded. *Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* an evergreen shrub. *Branches* slender, straggling. *Leaves* opposite, decussate, ovate or oval, acute, many-nerved, curving downwards. *Flowers* deep crimson. *Bundles of stamens* on very long claws; filaments radiating. *Styles* usually wavy.

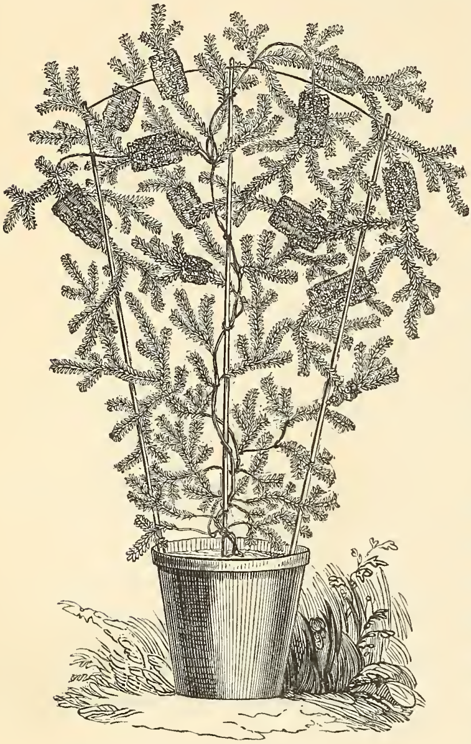
WE present a drawing of this interesting old plant, although it has been in Britain more than forty years, because its flowers are no less ornamental than singular, and are developed throughout the gloomiest part of the year, and likewise from its comparative scarcity in collections, and the desirableness of showing pictorially something of its character, in order to give a new stimulus to its cultivation. For the same reason we add a woodcut, which represents more of the habit of the species.

The south-west coast of New Holland is its natural habitat, and it was known in Britain as early as the year 1800, or shortly after. It is now to be met with in most nurseries, but chiefly in those private gardens where the older kinds of plants are yet cultivated.

From its straggling disposition, it is only when in a small state that it has the aspect of a dwarf shrub, unless it be occasionally pruned. But a large specimen may be made more compact by a trifling assistance in training, taking care to turn the points of the shoots downwards at first, as well for the purpose of bringing them nearer each other, and checking their elongation, as for inducing a freer production of lateral branches.

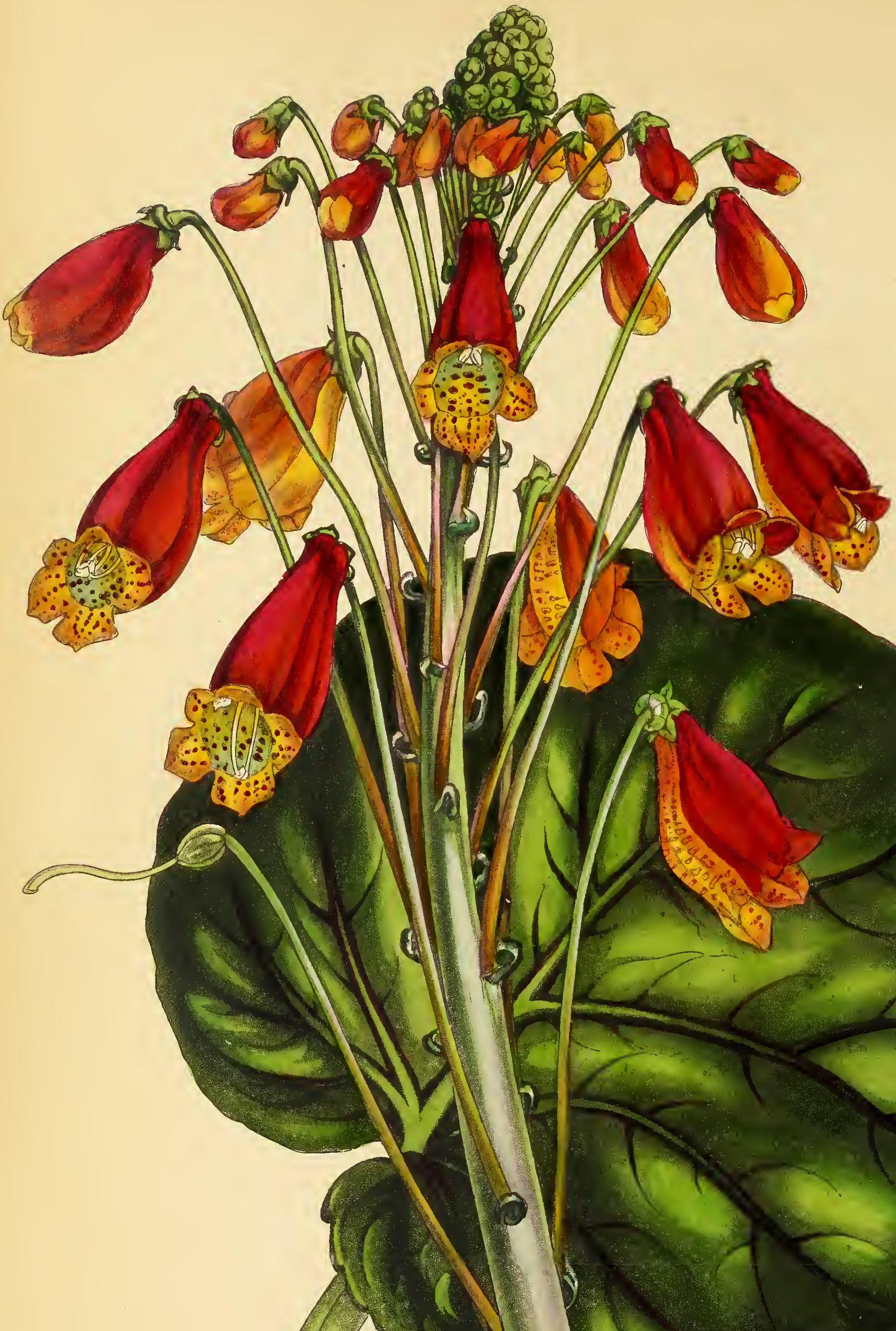
The curious blossoms commence unfolding in the autumn months, varying from September to November, and a succession is generally preserved far into the spring.

They are borne in lengthened clusters along the branches, which they completely encircle, and their position is most frequently under the point whence a bunch of lateral shoots emanate. The petals are small, greenish, and inconspicuous, and it is the delicate crimson stamens, which stand out nearly an inch from the stem, and the filaments of which radiate in all directions near the summit, that are the great objects of attraction. These, when fully expanded, present the appearance of a bottle-brush, and remain without fading for a considerable time. The leaves are also pleasing from their elegant figure, their closeness, and their peculiarly deep verdure.



We are indebted for the specimen from which our drawing is taken, to Mr. Edmonds, gardener to His Grace the Duke of Devonshire, at Chiswick, where the plant flowers splendidly in the greenhouse. It requires a soil of nearly equal parts loam and heath-mould, and the points of the branches should be fastened in a drooping position when the specimen begins to grow rambling or bare of shoots. Propagation is effected by cuttings, which must be carefully divested of their lower leaves, and planted in the spring or summer season.

The genus was named in compliment to Mary, Duchess of Beaufort, a patroness of botany.



Gesnera zebrina.

GESNÈRA ZEBRÌNA.

(ZEBRA-LEAVED GESNERA.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMIA.

NATURAL ORDER.
GESNERÀCEÆ.

Generic Character.—See p. 243.

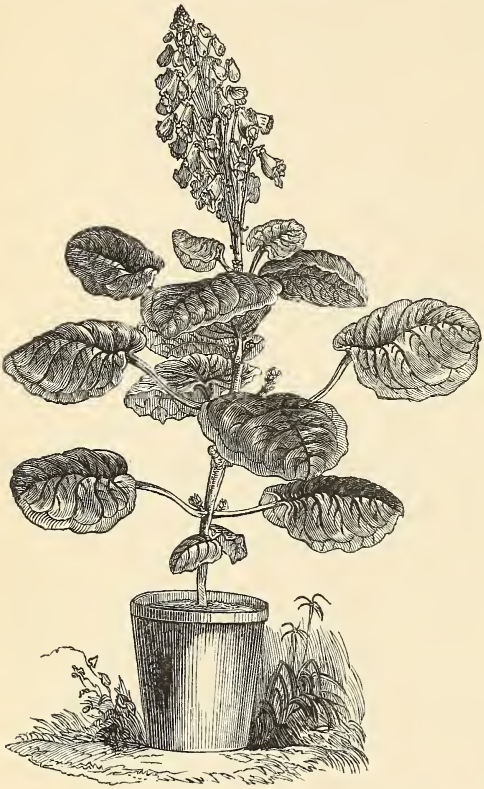
Specific Character.—*Plant* apparently an herbaceous perennial. *Stems* erect, succulent, downy. *Leaves* somewhat roundish, convex, revolute, and partially crenate at the margin, pubescent, deep green, veined and striped with reddish purple. *Spikes of flowers* terminal, ascending, indefinite. *Peduncles* very long, erect. *Corolla* drooping, orange-red above, pale orange below, with the segments of the limb almost equal, and its interior, as well as the throat, spotted with red.

In the history of floriculture, it usually happens that not more than two or three plants, of the highest class of beauty, are annually brought to light. The main characteristic of these is, that from their splendour at certain periods, or their attractiveness at all times, they are calculated for continuing in cultivation almost as long as ornamental plants shall be at all valued.

Of the nature thus pointed out is the handsome species of *Gesnera* here depicted, which may very properly be accounted one of the most meritorious plants which have developed themselves in the year just closed; for, not only does it arrest the attention during the time at which its blossoms are unfolded, but, by the diversified markings of its leaves, at every season when these are in perfection. And whether, on further experiment, it will prove an evergreen sub-shrubby plant, or will lose its stems and foliage in the later winter months, we are at present unable to say. The probability is that it will be found an herbaceous perennial, flowering in October, November, and December, and dying down, like some other species, after the inflorescence has all withered; though it is possible that it will partake more of the character of *G. mollis*, and acquire a woodiness of stem at the base.

Our drawing was taken from a plant which flowered very finely at Mr. Low's, Clapton, in October and November last, and on which there is yet a considerable number of flower-buds, if the season would permit their expansion. It was obtained by Mr. Low from Mr. Doncklaer, director of the Botanic Garden of Ghent, and is doubtless from some district of South America.

The species produces stout succulent stems, which mostly grow to six or nine inches in height before they protrude a flower-spike from their summit; but we have seen plants not more than three inches high beginning to show flower. The flower-stem rises perpendicularly from the top of the general stem three or four inches, where the lovely blossoms are spread out on long slender stalks, and continue to be thrown out, indefinitely, till the height of a foot or eighteen inches is attained, when there still seems an equal number of buds at the top, and lateral flower-bearing shoots are, moreover, liberally developed from near the base. The colour of the blooms is of a very rich orange red on the upper part, and a light yellowish orange beneath, with a quantity of bright red spots in the throat. Being pendulous, they are, when the plant is elevated on an ordinary stage, examined to great advantage.



But the leaves are, perhaps, the most interesting, because the most permanent features. They are of a rich and lively green, with numerous and irregular streaks and bands of a purplish tint, and the whole has a remarkably velvety appearance.

It has hitherto been managed as a stove plant, and kept in a moderate heat, with proper supplies of moisture. As it blooms in the autumn, and does not cease on the approach of winter, it will be advisable to go on watering it till it shows natural signs of decay, when its habits may be fully ascertained. A rather rich compost will be appropriate; and it would seem capable of ready increase by cuttings. Seeds, too, will most likely be perfected.

FLORICULTURAL NOTICES.

NEW OR RARE PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER.

Begònia diversifòlia. Assimilating to *B. Martiana* in some particulars, but differing in the foliage, which is small, very unequal in its two sides, and greatly varying in form. It is a plant of an interesting appearance, and produces fine pink flowers, which appear to be almost without a rival, in size and beauty, among the allied species. It flowered lately, and for a considerable period, at Mr. Low's, Clapton.

Epácris, *hybrid.* Some novelties, in the way of hybrid Epacrises, are now flowering in Mr. Low's greenhouses, at Clapton; and one, which is the most distinct, has peculiarly dense recurved leaves, like those of *E. coccinea*, and short, thickly-set flowers. But the latter are white in the lower part of the tube, and deep pink at the top; thus presenting two separate and clearly defined tints in the same blossom. What is rather curious, they do not seem to expand when perfect, but remain constantly closed.

Prímula sinénsis; *var.* plèna. This very lovely variety has been perpetuated by division in the nursery of Messrs. Henderson, Pine-Apple Place; and though, not being capable of increase in any other way, it is not likely soon to become very common, Messrs. Rollison and other nurserymen have plants of it. The beautiful flowers issue in numerous scattered clusters, in an ascending series from one stalk, and, like those of some of the single varieties, are disposed somewhat in the manner of many kinds of candelabra.

Sophronìtis grandiflòra. Messrs. Loddiges have recently been successful in blooming this rare and charming little Orchidaceous plant. Its pseudo-bulbs and leaves are not together more than an inch or two in length; and the flowers, which are of a rich orange or light cinnabar colour, are fully an inch in diameter. Grown on a small log of wood, for which it is singularly adapted, it has a remarkably pleasing effect.

OPERATIONS FOR JANUARY.

In ordinary winters, January is usually the most severe month of the year; and hence the cultivator will necessarily be much occupied in the protection of tender plants from frost. Conventional usage describes this protection as the exclusion of cold; and though we would not object so much to phraseology that did not mislead, in the instance before us, a feeling has prevailed in favour of the literal acceptation of the term, which has led to the most erroneous practices. It is therefore necessary to say that shelter consists rather in the retention of the natural heat of the plant, and of the atmosphere that surrounds it.

Often as we have impressed the above consideration on the public mind, we cannot refrain from here stating that the legitimate deduction from such premises is, that the means and material of protection should be *external*, and between its object and the cold air ; extending the advantages of this provision, when requisite, (and only then,) by the introduction of additional heat from below.

In greenhouses and pits which are properly covered by mats, straw-hurdles, or thatch, a fire will very rarely be needful to maintain a temperature above freezing. But there is another enemy to tender vegetation besides frost, and one, perhaps, more dangerous on account of its being little thought of. We mean excessive dampness. And where the air without is so humid or so cold that ventilation would be of no service, or cannot be afforded, fire-heat must be sparingly applied. The moisture we have yet spoken of, however, is that arising from natural causes ; but when plants have been newly watered, there are unavoidable exhalations which fill the air with humidity ; and if these cannot be discharged by the admission of a dry outer current, they should be dissipated by artificial heat. Still, never more than enough to effect the object ought to be employed, and it should cease with the accomplishment of the end for which it was intended.

Stoves, again, may require a little higher temperature than greenhouses ; but if the plants have been judiciously managed, they will never be hurt by the thermometer ranging at 45° and upwards, which heat may be mostly maintained by exterior shelter, aided occasionally by slight fires. Many degrees above this, in severe weather, will be injurious rather than beneficial, save for growing plants, or for those which it may be desirable to force. Especially should water be cautiously given at the present period, as it not only induces mouldiness, (than which nothing can be more unsightly or hurtful,) but occasions an unseasonable development, which alike weakens and endangers the plants.

For delicate plants in the open ground, next to surrounding them, at some distance from the branches, with mats or tarred canvas, the most effectual method of preservation is to place two or three inches of any dry non-conducting substance over the earth around their stems. By this means, their roots are kept comparatively warm, and are enabled to send a genial current into the branches, by which they are much assisted in maintaining their heat. Besides, most plants that have their branches destroyed will, if the roots and lower parts of the stems be kept alive, sprout forth with renewed vigour in the ensuing spring.

GENERAL INDEX.

A.

Abutilon Bedfordianum, 211
Acacia biflora, 44
— platyptera, 44
Acclimatation of exotics, limited application of the term, 60; hints for the effectuation of the, 13, 37, 60
Achimenes longiflora, 213
— rosea, 213
Acrophyllum venosum, 165
Æonium cruentum, 259
Aerides quinquevulnerum, 241; treatment of, 242
Air, constituents of atmospheric, 84, 105, 201; its influence on vegetation, 201; experiments of Mr. Ward on its slight value to certain plants, 203
Air-plant, five-blotched, 241
Air-tight cases for containing plants, those of Mr. Ward described, 203
Alders best adapted for placing near water, 162
Alkalies, the great source of nutriment to plants, 154
Allamanda cathartica, 77; best system of cultivating, 78
Alstrœmeria, sorts that will thrive in an exposed plot, 87
Alyssum orientale, *var.* variegatum, 94
American plants, heath-soil not essential to, 39
Ammonia, what it is composed of, 129; its presence in rain-water, 178; useful in softening water, 179
Analysis of soils, its definition and modes, 33
Anchusa petiolata, 67
Andromeda tetragona, 94
Angelonia cornigera, 18
Animal life, its connexion with that of vegetables, 106
Annuals, time for sowing tender, 24; plan of flowering them in spring in the open ground, 181; many of the Californian, hardy, 180
Antirrhinum majus, variegated variety of, 165
Aquariums, management of stove, 111; necessity for heating them, 112
Aralia japonica, a handsome ornament to lawns, 229
Arboretums, remarks on, 41
Arbutus, new species of, 94
— tomentosa, 94
Architecture, observations on garden, 107, 183, 231, 255; importance of a knowledge of it to the gardener, 111
Architectural beauty and symmetry desirable in plant-houses, 108
Arctostaphylos nitida, 259
Azalea Gledstanesii, 165
— indica, *var.* splendens, 94

B.

Bæckia camphorosmæ, 214
Batatas bonariensis, 25; its culture and propagation, 26
Beaufortia decussata, 269; management of, 270
Begonia diversifolia, 273
— heracleifolia, 94
— Martiana, 237
Berberis coriaria, 187
Bignonia capreolata, 245; its general culture, 246
Bignonia speciosa, 187
Birch-tree, admirably fitted for planting on the margin of a stream, 162
Bog earth, hints on the use of, 129
Bomarea acutifolia, *var.* punctata, 116
Bomarea simplex, 91
Boronia anemonæfolia, 45
— ledifolia, 45
— triphylla, *var.* latifolia, 212, 45, 123
Boronia viminea, 165, 189
Bossiæa disticha, 235
— paucifolia, 214
— tenuicaulis, 212
Bottom heat, its utility, 209
Box edgings, time for clipping, 168
Brachycome iberidifolia, 139; thrives best in a pot, 180
Brassia Lawrenceana, 68
Brownea grandiceps, 139
Brugmansia floribunda, 141
Bulbs, season for planting, 216; rest essential for, 192, 216; plan of potting early-flowering, 17
Bulbs and corms, those proper for planting in a prepared border, 15
Burlingtonia rigida, 193; mode of treating, 194

C.

Cactaceæ, summer treatment of, 71, 120, 192
Calanthe versicolor,
Callistachys linearis, 163
— longifolia, 31 ; habits and culture of, 32
Callithauma angustifolium, 92
— viridiflorum, 92
Camellia japonica, *var.* Albertii, 53
Camellia, chief points in the cultivation of, 54
Caprifolium sempervirens, grown to a pole, has a fine effect, 181
Caprifolium Youngii, beauty of, 181
Carbon, nature of, 56 ; its origin, 84 ; proportion contained in the air, 105
Carbonic acid gas, how it is formed, 129
Catasetum callosum, 18
— citrinum, 214
— cornutum, 18
— deltoideum, 189
— laminatum, 189
— lanciferum, 18
— Trulla, 140
Cattleya Aclandiæ, 214
— bicolor, 214
— citrina, 214
— guttata, *var.* Russelliana, 262
— Harrisoniæ, *var.* alba, 262
Chemistry, facts in horticultural, 33, 55, 81, 105, 129, 153, 177, 201, 223
Chorozema Dicksonii, 173 ; system of retaining it dwarf, 174
Chorozema spectabilis, 118
Chysis bractescens, 92
Cinerarias, hybrid, 118
Circular conservatories, recommendation of, 257
Cirrhopetalum Cumingii, 165
Cisterns for conservatories, various descriptions of, 259
Clematis cœrulea, plan for keeping it as a dwarf shrub, 155
Clematis Sieboldii, best system of training, 156
Clerodendrum speciosissimum, 165
— squamatum, different from C. speciosissimum, 165
— splendens, 237
Clianthus carneus, 212
Climbing plants, superior methods of training, 64 ; conditions that affect their flowering, 65 ; plan for supporting the dwarf kinds, 254 ; instructions for managing, 143, 168
Clintonia pulchella, white-flowered variety of, 141
Cobæa stipularis, 116
Coburghia coccinea, 92
— trichroma, 92
Cœlogyne aristata, 235
— Cumingii, 116
— flaccida, 45, 140
Coldness, comparative, of low and elevated tracts, 36
Colea floribunda, 92
Coleus barbatus, 219 ; directions for growing, 220
Colours produced by light, 225
Columnea Schiediana, 238
Combustion probably caused by the development of latent light, 225 ; its connexion with electricity, 251
Comparettia rosea, 238
Conservatories, improper positions for, 183 ; most suitable site, 185 ; when high, not prejudicial to plants, if well glazed on all sides, 232
Coverings for plant-houses, economize heat, and benefit the plants, 23, 259, 264 ; mode of making them, 240
Crambe cordifolia, 165
Crocus Adamicus, 116
— speciosus, 93
— suaveolens, 93
Crocuses, receptacles for early-flowering, 17
Cuphea Melvilla, 197 ; its management, 198
Curvilinear roofs for plant-houses, superiority of, 256
Cyclogyne canescens, 166
Cymbidium pubescens, 163
Cynoglossum glochidiatum, 68
Cypripedium barbatum, 166
Cyrtochilum filipes, 166, 259
— maculatum, different varieties of, 45
Cytisus filipes, 166
— nigricans, grafted as a standard, 228

D.

Dahlias, period for exciting, 24
Daphne japonica, 46, 175 ; treatment of, 176
Deciduous plants best fitted for naturalization, 14, 62
Dendrobium calamiforme, 46
Dendrobium discolor, 46, 95, 212
— elongatum, 46
— fimbriatum, appropriate way of growing, 157
— Heyneanum, 70
— macrophyllum, 97 ; its culture, 98
— pulchellum, *var.* 95
— sulcatum, 189
Dendrochilum filiformis, 189
Deutzia scabra, method of inducing it to flower freely, 157
Dicripta bicolor, 262
Diplolæna Dampieri, 260
Drainage essential in acclimatizing plants, 13, 37, 62
Dryness indispensable to tender plants in the winter, 12, 23

E.

Earths, mode of analyzing, 33
Echeveria lurida, 18
— pulverulenta, 189
Echinocactus corynodes, 260
Economy, false notions of, in the construction of floricultural erections, 232
Electricity, facts concerning, 57, 177, 251 ; probable origin of, 224 ; its nature described, 249 ; how it affects vegetation, 249

Elements of vegetable organization, 55
Epidendrum alatum, 141
  — calochocheilum, 235
  — Grahami, 163
  — phœniceum, 190
Epiphyllum purpurascens, 22, 80
  — truncatum, *var.* violaceum, 79; culture of, 80
Eria armeniaca, 187
  — bractescens, 718
  — convallarioides, 260
  — longilabris, 118
Erica Jacksonii, 149
  — hints on managing the genus, 150
Erythrina Crista-galli, its treatment as a half-hardy border shrub, 85
Eucomis punctata, thrives well in an open border, 86
Euthales macrophylla, 19
Evergreens, not so suitable as deciduous plants for naturalizing, 14; dwarf sorts of, for planting on lawns, 38
Exotics, acclimatation of, 60
  — proper borders for their cultivation in the open air, 11

F.

Floricultural Notices, 18, 43, 67, 91, 139, 163, 187, 211, 235, 259, 273
Flower-buds, advantages of removing them in order to increase the future development, 72, 96, 143
Flowers, importance of plucking decayed, 143
Food of plants, derived from the atmosphere, 129; alkalies its principal source, 154
Forcing, time at which it should be commenced, 216
Forcing Roses, &c., particulars most to be regarded in, 208; novel plan for, 211
Franciscea latifolia, 260
Frost, mode of remedying its effects on plants that have been slightly injured by it in the open ground, 64
Fuchsia cordifolia, 141
  — corymbiflora, 7; general culture of, 8
  — fulgens and its hybrids, plan of forcing, 135
  — radicans, 262
Fuchsias, treatment of, 131; well adapted for planting in a sheltered border, 14, 134; propriety of pruning the dwarf species, 133
Fumigation with tobacco injurious to Orchidaceous flowers, 96

G.

Galeandra Devoniana, 145; how to cultivate, 146
Garden architecture, remarks on, 107, 183, 231, 255
Gardening as a science, 9, 33, 55, 81, 105, 129, 153, 177, 201, 223, 249
Gentiana septemfida, 51; hints on growing, 52
  — verna, 118
Geranium rubifolium, 19
Gesnera Arnoldii, 166
  — bulbosa, 187
  — mollis, 243; way to cultivate, 244
  — new species of, 190,
  — zebrina, 238, 271; system of treating, 272
Glass, usefulness of coloured, in germinating seeds, 223
Goldfussia glomerata, 121; routine of treatment for, 122
Gongora bufonia, 19
Grabowskia duplicata, 19
Greenhouse plants, season for exposing, 120
Grottoes, proper position and construction of, 138

H.

Hæmanthus tenuiflorus, *var.* mozambicensis, 116
Half-hardy plants, time and method of transplanting, 95; propagation of, 167, 192
Hardenbergia Comptoniana, 27; method of cultivating, 28
Hardenbergia macrophylla, 267; treatment of, 268
Heat, beneficial to the roots of plants, 209
Heaths, points in the management of, 150; moor soil not indispensable to the hardy kinds, 40
Heath-soil, means of ascertaining the quality of, 36; constituents of various specimens, 84; necessity of exposing it before use, 130
Heimia salicifolia, *var.* grandiflora, 260
Helichrysum niveum, 99; its culture, 100
Herbertia cœrulea, 93
Hibiscus Cameronii, 3; instructions for growing, 4
Hills, less visited by frosts than low situations, 36; and more proper for planting tender plants upon, 37
Honeysuckles, on training them singly to poles, 182
Horticultural school, suggestions respecting a grand central, 9
Houlletia Brocklehurstiana, 215
Humus, its nature investigated, 81; not exhausted by vegetables, 130
Huntleya violacea, 1; its treatment, 2
Hypocalyptus obcordatus, 212

I.

Impatiens candida, 93
  — rosea, 117
Indian Cress, Mr. Moritz's, 199
Ipomœa batatoides, 163
  — ficifolia, 68, 238
  — Hardingii, 142
  — Learii, principal points in the growth of, 204
  — tyrianthina, 73, 263; its culture, 74
Iron, in heath-soil, not injurious to plants, 84
Ismene virescens, 43
Isolated trees, hints on planting, 159
Isomeris arborea, 20

K.

KAULFUSSIA amelloides, 195 ; ordinary culture of, 196
Kreysigia multiflora, 261

L.

LÆLIA acuminata, 117
Lasiopetalum macrophyllum, 261
Lawns, dwarf evergreens for planting on, 38
Lechenaultia biloba, 151 ; mode of growing, 152
Leycesteria formosa, its treatment as a border shrub, 15
Liebig's "Organic Chemistry," noticed and commented on, 55, 81, 105, 130, 178, 201
Life, relation of animal to vegetable, 106
Light, its effects on plants, 223 ; possibly the cause of all electrical phenomena, 224 ; its presence universal, 225 ; the source of colour, 225 ;
Lilium atrosanguineum, *var.* maculatum, 190
— eximium, remarks on, 128
— speciosum, *var.* album, 127
— — directions for growing it to the greatest perfection, 158
Lily, culture of the Japan species of, 128, 158
Lisianthus Russellianus, mode of preserving it through the winter, 226
Loam, constituents and varieties of, 34, 154
Loasa Pentlandica, 142
Lombardy Poplars, not adapted for standing alone, 162
Lophospermum erubescens, *var.* spectabile, 75 ; method of cultivating, 76
Lophospermum erubescens and scandens, their treatment as border-flowers, 253

M.

MALVA Creeana, its treatment as a summer border-flower, 228
Malva lateritia, 20
Manures, character and offices of, 129, 153
Marianthus cœruleo-punctatus, 190, 247 ; management of, 248
Marianthus, new species of, 262
Martynia fragrans, 20
Maxillaria aromatica, *var.* 118
— citrina, 119
Mentzelia stipitata, its cultivation in the open border, 86
Mimulus, treatment of the species in a common flower-border, 88
Mirbelia floribunda, 70, 103 ; attention requisite for, 104
Monolopia major, 20
Mormodes pardina, 236, *var.* unicolor, 140
Musa superba, 43

N.

NATURALIZATION of exotics, application of the phrase, 60 ; important principles to be observed in the, 13, 37, 60
Nemesia floribunda, 190
Nemophila insignis, hardihood of, 180
Nerine, culture of the species in front of a south wall, 86
Nightshade, Jasmine-like, 5
Niphæa oblonga, 263
Nitrogen, means of detecting, and properties of, 56, 105
Nymphæa cœrulea, heat beneficial to, 112.

O.

ODONTOGLOSSUM grande, 49 ; culture of, 50
— pulchellum, 190, 213
Œnothera fruticosa, *var.* indica, 43
Oncidium Insleayii, 142, 265 ; its treatment, 266
— longifolium, 119
— macrantherum, 20
— monoceras, 188
— ornythorhynchum, dark-flowered variety of, 263
— Wrayæ, 43
Operations for January, 273
— February, 23
— March, 47
— April, 70
— May, 95
— June, 119
— July, 143
— August, 167
— September, 191
— October, 215
— November, 239
— December, 263
Orchidaceæ, receptacles for, according to the habits of the species, 264 ; hints on potting, 47 ; their management, 120
Orchis foliosa, 236
Ornamental plants, culture of a few, 155, 179, 226, 253
Orthosiphon incurvus, 21
Oxalis fruticosa, 188
— lasiandra, 213
Oxyanthus versicolor, 117
Oxygen, character of, 56 ; quantity usually in in the air, 105

P.

PASCALIA glauca, 125 ; management of, 126
Passiflora quadrangularis, and probably other similar species, may be grown in a greenhouse, 229
Paxtonia rosea, raised from seed, 190
Pelargoniums, treatment of, 48, 120, 144, 168, 192
Pentstemon gentianoides, several varieties of, 22
Pentstemons, appropriate for placing in a protected border, 15
Petunias, suggestions for training them to trellises on open lawns, 96
Physianthus auricomus, 188
Physolobium carinatum, 142
— gracilis, 142

Physolobium, distinction of the genus from Kennedya, 142
Pimelea spectabilis, 70, 140
Pinus, situation in which the species succeed best, 37
Plants, elements of, 55; their influence on animal life, 106; nourished chiefly through the atmosphere, 129
Polystachya reflexa, 142
Portugal Laurels, method of preparing standard, 58
Portulaca Thellusonii, 29; its cultivation in the open ground, the greenhouse, and the stove, 30
Posoqueria versicolor, 117
Potassa, the grand agent in vegetable nutrition, 154
Potentilla insignis, 164
Pots for early Crocuses and Bulbs, 17
Potting, the habits of plants to regulate the manner of, 49; time for a general, 47, 71
Precocious developments, necessity for checking, 191, 239
Prepusa Hookeriana, 261
Primula sinensis, *var.* plena, 273
Propagation, fittest period for, 48
Protection, mode of applying it to borders containing exotics, 15; for tender shrubs, 63, 240; injurious to half-hardy shrubs when continued too long or too constantly, 64
Pruning shrubs, general directions for, 264
Puya heterophylla, 21

R.

Rain water contains ammonia, 178; hence its superior fitness for watering plants, 179
Receptacles, for Orchidaceæ, 113; for early flowering Bulbs, 17
Rhododendron Gibsonii, 217; system of cultivating, 218
Rhododendrons, prefer a sheltered and somewhat shaded spot, 39; plan of preparing standard, 58
Ridge and furrow roofs for plant-houses, arguments in support of, 256
Rockeries, hints on forming and placing, 135; objectionable positions for, 138
Roof for a plant structure, the form of, most adapted to particular kinds, 257
Rosa Devoniensis, 169; hints for managing, 170
Rose Bay, Mr. Gibson's, 217
Rose, Devonshire, 169
Roses, remarks on forcing, 208; best time for pruning tender, 48; season for layering, 216, 264; suggestions for budding so as to form standards of various heights, 168

S.

Saccolabium, new species of, 22
Salts or alkalies, the best manures, 154
Salvia confertiflora, *var.* 236
— hians, 164
— regla, 69
Salvia tubifera, 188
Schizanthus Evansianus, 171; plan of cultivating, 172
School of Horticulture, hints for a great central, 10
Schweiggeria pauciflora, 164
Science of gardening, 9, 33, 55, 81, 105, 129, 153, 177, 201, 223, 249
Seedling plants in a smll state best for acclimatizing, 62
Seeds, on saving, 168; general season for sowing, 48
Shallow soil necessary in acclimatation, 37, 62
Shrubs, time for transplanting, 216, 263
Sobralia sessilis, 69
Soils, analyzation of, 33
Solanum jasminoides, 5; treatment of, 6
— macrantherum, 44
Solar rays, different powers of the, 223
Sophronitis grandiflora, 273
Sowerbæa laxiflora, 44
Span-roofed houses, best for growing plants to perfection in, 232; their details, 234
Spiræa kamtchatica, *var.* himalensis, 21
Sprekelia cybister, 117
— glauca, 69
Stachys coccinea, 101; its cultivation as a border-flower, 102
Standard Portugal Laurels and evergreen shrubs, fittest situation for, 60
Stanhopea aurea, 23
Stanhopeas, wire baskets best for, 114
Stevia trachelioides, 69
Stove aquariums, 111
Stove plants, directions for potting, 47
Strobilanthes scabra, 141
— sessilis, 236
Stylidium ciliatum, 164
Succulent plants, hints on shifting, 48
Symmetry desirable in plant structures, 231
Syringing plants, utility of, 144

T.

Tabernæmontana dichotoma, 236
Tecoma grandiflora, different modes of cultivating, 89
Tender exotics, suitable borders for growing them in the open air, 11; those that will thrive in a sheltered border, 85
Thunbergia, treatment of some of the species in the open ground during summer, 253
Tithonia ovata, 237
Tooth-tongue, magnificent, 49
Trees, on planting them singly, 159; where detached specimens are objectionable, 160; and where appropriate, 161; localities in which groups should prevail, 160; period for shifting, 216, 263
Trellises best adapted for supporting climbing plants, 65
Triptilion spinosum, 93
Tropæolum Moritzianum, 21, 199, 273; its culture, 200
Trumpet-flower, tendrilled, 245

V.

VALLEYS, from their dampness and coldness, unfit for the naturalization of plants, 37
Vegetable food, obtained mainly from the atmosphere, 129 ; alkalies a prime source of, 154
Vegetable life, reciprocal influence of animal and, 106
Vegetation, its elements, 55
Ventilation of plant-houses, principles to be attended to in the, 258 ; its importance in winter, 24, 47, 72, 144, 168, 240
Virgin soil, its exciting effects accounted for, 154

W.

WALLS prejudicial in some parts of greenhouses, 232
Watering plants, rules for, 119
Water, component parts of, 129, 177 ; its agency on vegetation, 177 ; not a solvent of the earthy substance of manures, but of the gases evolved by them, 178 ; what gives it softness, 179 ; advantages of that produced by rain, 179
Weather, kinds of work to be done in particular, during winter, 263
Weeping Willow, places in which it should be planted, 162
Winds, advisability of screening tender plants from cold ones, 71
Witsenia maura, 221 ; its management, 222

Z.

ZICHYA, peculiarities of the genus, 147
— pannosa, 147 ; culture of, 148

LONDON :
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

BOUND BY HW